

# NORTHERN ALBERTA INSTITUTE OF TECHNOLOGY

EDMONTON, ALBERTA, CANADA



CALENDAR 1964-65



**THE NORTHERN ALBERTA  
INSTITUTE OF TECHNOLOGY  
11762-106th Street.  
EDMONTON**

**UNDER THE DIRECTION OF THE ALBERTA DEPARTMENT OF EDUCATION  
FINANCIALLY ASSISTED BY THE GOVERNMENT OF CANADA**

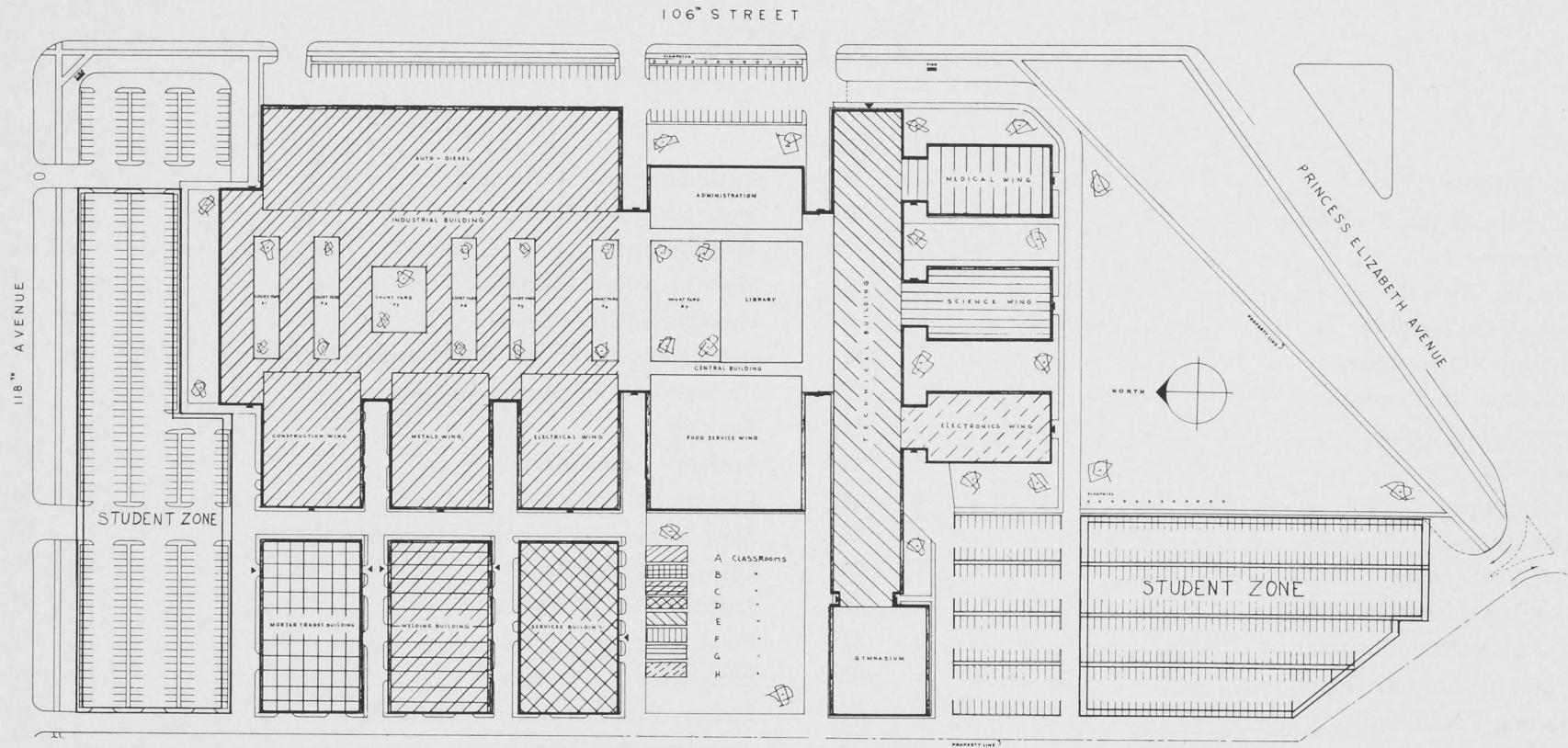
HON. A. O. AALBORG, Minister of Education  
W. H. SWIFT, Deputy Minister

J. P. MITCHELL, Director of Vocational Education  
W. A. B. SAUNDERS, Principal



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## THE INSTITUTE

The Northern Alberta Institute of Technology is located on an excellent 26-acre site next to the Municipal Airport in the City of Edmonton. Modern and up-to-date in design and equipment, ready to serve the ever increasing needs of the students of the Province.

The school covers an area of almost 15 acres of floor space essentially all under one roof. The respective buildings are known as the Industrial Building, Central Building, Technical Building, Mortar Trades Building, Welding Building and Service Building, the latter three being separate from the main structure.

The Industrial Building is used primarily in the training of Apprentices, and contains many classrooms, shops, offices and service areas.

The Central Building houses the General Administrative Offices, the McNally Library and the entire food service area. The Cafeteria and dining services provide reasonably priced meals for students and staff and provide training for Cooks, Bakers and Waiters. The dining facilities are capable of handling approximately 1,100 students at one time.

The Technical Building is a two storey structure with three intersecting wings and Gymnasium, divided between classrooms, laboratories, offices and student areas. The facilities provide instruc-

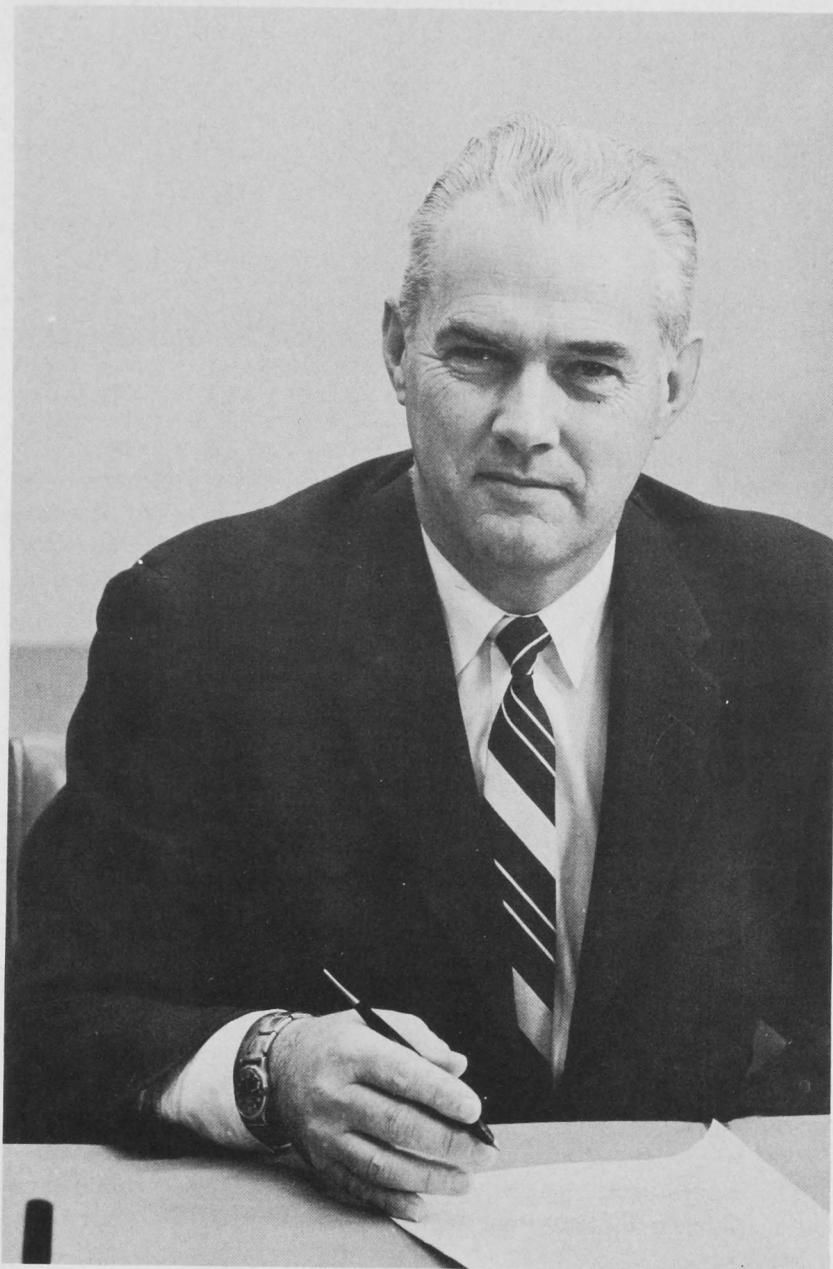
tional space for the Technology students, Business Education and Vocational students including a modern training school for Barbers and Hairdressers. The Medical Wing provides complete facilities for the training of X-ray Technicians, Medical Laboratory Technicians and Dental Assistants.

The Mortar Trades Building provides facilities for the training of Apprentice Bricklayers, Plasterers, Painting and Decorating and the building trades in general. The Welding Building has complete equipment for the training of welders in all aspects of the trade.

The complete facilities have been designed to accommodate a maximum of 2,400 day students at any one time, and a possible 2,500 at night school. It is expected that by 1966 up to 10,000 students will attend the school annually, in day and night courses.

The first students arrived at the Institute on October 1, 1962, a class of 29 Communication Electricians. By the end of this school year more than 4,000 apprenticeship students will have received instruction at the Institute in twenty different trades.

The future looks bright and promising with every indication pointing towards the need for increased facilities in the very near future.



## THE ROLE OF THE TECHNICIAN

It is obvious that if Canada is to compete as an industrial nation, she must produce the manpower industry requires. It is our sincere belief that this Institute will enable young people to receive the necessary preparation in the semi-professional or technical, business and trades training areas to meet the demands of modern industry.

In the past our industries did not require many technicians, but there has been a dramatic change in the past decade. Statistics now show that on a percentage basis, our greatest employment demand lies in the semi-professional or technician area. With this new demand for technicians across the land, prospective students want solid answers to a host of questions. In this calendar we have tried to answer as many of these questions as possible.

We hope that this information will arouse your curiosity. We further hope that you will investigate the possibilities available to technicians and tradesmen. Consult industry, talk to employers, talk to the people engaged in the type of work you would like to do.

While we do not elaborate on our Apprenticeship Division in this publication, trade-training may appeal to you. If such is the case we would ask you to write directly to us for details.

*W.C.B. Saunders*

PRINCIPAL

# FOREWORD

## CHARACTERISTICS OF A TECHNICAL INSTITUTE

The courses in a Technical Institute are technological in nature and lie in the post-High School area. They differ in content and purpose from those of the University which trains the professionally-qualified man or woman, who is primarily concerned with the development of new knowledge and ideas. The technician enters at this point and does his or her part in applying this new knowledge to the practical situation—in turning the ideas into reality.

The purpose of a Technical Institute is to prepare individuals for various technical positions within the fields of engineering, medicine, business and so on, with the scope of the training program being more limited than that required to prepare for a career as a professional person.

Technical Institute courses are based upon principles of science and include sufficient post-High School mathematics to enable the student to accomplish the technical objectives of the course. Emphasis is always placed on the use of rational processes in the fundamental portions of the curricula.

Programs of instruction are briefer and usually more completely technical in content than those for professional training, although both deal with the same general fields of industry and engineering. Technical Institute courses do not lead to the baccalaureate degree. Designations such as Engineering Aide, Technical Aide, Engineering Technician, Junior Engineer and Technician are appropriate to be conferred upon graduates of Technical Institutes.

The Northern Alberta Institute of Technology is divided into four major divisions:

(1) The Apprenticeship Division

This Division will provide instruction for apprentices in the following designated trades:

Appliance Servicing

Auto Body Repair

Carpentry

Electrical (Construction)

Electrical (Communication)

Electrical (Power)

Gasfitting

Heavy Duty Repair

Motor Vehicle Repair

Painting and Decorating

Baking

Bricklaying

Plastering

Plumbing

Radio Technician

Sheet Metal

Steamfitting

Tile-setters

Welding

(1) A Pre-Employment Courses

Construction

Commercial Sign Writing

Factory Woodworking

Radio

Welding

(2) The Technology Division

This Division will offer post-High School and semi-professional programs in the following areas:

Architectural Technology

Chemical Technology

Civil Technology

Dental Technician

Dental Mechanic

Dental Assistant

Drafting Technology

Electronic Technology

Gas Technology

Heavy Duty

Equipment Technology

Industrial Electrical  
Technology

Instrumentation Technology

Materials Technology

Medical Laboratory  
Technology

Photographic Technology

Production Technology

Refrigeration and Air  
Conditioning Technology

X-ray Technology

(3) The Business Education and Vocational Division.

This Division will undertake training in the following courses:

Banking

Business Administration

Commercial Cooking

Data Processing

Ladies, Dressmaking  
and Tailoring

Office Machine Repair

(3) A Distributive Education

Secretarial Training

Waiter and Waitress Training

(3) B In conjunction with C.V.T., the following courses are offered:

Commercial

Barbering

Hairdressing

(4) Evening Division

This Division will offer a wide range of courses at all levels with emphasis on up-grading of tradesmen, technicians, business and management personnel. The Division will commence full operations in September of 1964. A separate Calendar will be available by May 31, 1964.

The educational qualifications required for entry into the various courses will be found on Page 17.

# CALENDAR, 1964-65

**July 1**—Wednesday, Dominion Day. Institute closed.

**September 2**—Wednesday, 8:30 a.m., Registration for Medical X-ray Technicians.

**September 7**—Monday, Labour Day. Institute closed.

**September 8**—Tuesday, 8:30 a.m.

Registration for Dental Assistant, Medical Laboratory Technology, and 1st year Commercial Cooking.

**September 10**—Thursday, 8:30 a.m.

Registration for Civil Technology, Drafting Technology, Electronic Technology, Instrumentation Technology, Architectural Technology, Gas Technology, Industrial Electrical Technology, Industrial Laboratory Technology, Materials Technology.

**September 11**—Friday, 8:30 a.m.

Registration for Banking, Business Administration, Data Processing, Dental Mechanic, Dental Technician, Diesel and Heavy Duty Equipment, Office Machine Repair, Photographic Technology, Production Technology, Refrigeration and Air Conditioning Technology, Secretarial Technology and Distributive Education.

**September 14**—Monday, 8:30 a.m.

Registration for all Second Year Students.

**September 16**—Wednesday, Lectures commence for all classes.

**September 21**—Monday

Registration for Evening Courses. (See Evening Course calendar for details).

**September 28**—Monday

Registration for all day Sewing Classes and Food Sales and Service.

**October 12**—Monday, Thanksgiving Day. Institute closed.

**October 26**—Monday

Registration for Pre-Employment Sign Writing, Factory Woodworking and Construction Trades.

**October 28**—Awards Day.



**November 11**—Wednesday, Remembrance Day. Institute closed.

**November 27**—Friday, First Quarter Examinations commence.

**December 3**—Thursday, Second Quarter commences.

**December 18**—Friday, Institute closes for Christmas Vacation.

**December 25**—Christmas Day. Institute closed.

**December 26**—Boxing Day. Institute closed.

**January 1**—New Year's Day. Institute closed.

**January 4**—Monday, Institute reopens for all classes and Registration for Food Sales and Service.

**February 1**—Monday, 8:30 a.m.

Registration for Spring Class of Medical X-ray Technicians.

**February 25**—Thursday, Second Quarter Examinations commence.

**March 14**—Registration for Food Sales and Service.

**March 17 - 18**—Open House (7:00 p.m. to 10:00 p.m.).

**March 19**—Open House for High School Students from outside Edmonton (9:00 a.m. to 4:00 p.m.).

**April 16**—Good Friday. Institute closed.

**April 19**—Easter Monday. Institute closed.

**May 6**—Closing Exercises.

**May 14**—Friday, Last Quarter Examinations.

**May 24**—Monday, Victoria Day. Institute closed.

**July 1**—Thursday, Dominion Day. Institute closed.

# STAFF OF THE INSTITUTE

Principal - - - - - W. A. B. Saunders, B.Sc., M.Sc.,  
P.Eng., (P.I.T.A. Dip.)

Supervisor, Technology Division M. F. Kelcey, B.A., P.Geoph.

Supervisor, Apprenticeship  
Division - - - - - G. A. Sanders, B.Ed., (Prof. Cert.),  
(Jny. Carpenter)

Supervisor, Business Education  
and Vocational Division - - G. W. Carter, (Certs. Tchr., Jny.)

Director of Evening Division - J. O. Starritt, m.i.d., B.A., LL.B.

Shop Director - - - - - O. Kingsep (P.I.T.A. Dip.)

Bursar - - - - - J. E. Raicos

Registrar - - - - - L. C. Semrau

Librarian - - - - - J. I. Paul, B.Sc., B.L.S.

Assistant to the Principal - - W. G. Coulson, B.Com.

Student Co-ordinator - - - R. G. Meadus, B.P.E., B.Ed.

Accountant - - - - - E. W. Sandstrom

Nurse - - - - - D. Smith, R.N., D.P.H.N., B.Sc.,  
M.P.H.

## TECHNOLOGY DIVISION

Electronics Department Head - R. A. McAlpine, B.Sc., P.Eng.

Communications Section Head G. A. Brown, B.Sc., (P.I.T.A. Dip.)

Instructors - - - - - G. A. Campbell, B.Sc., (Jny. Radio)  
S. N. Simons, (P.I.T.A. Dip.), (Jny.  
Radio)

Industrial Electronics  
Section Head - - - - - A. D. Harvey, B.Sc., (P.I.T.A. Dip.)

Instructors - - - - - C. H. Beeken, Associate in Arts,  
(Jny. Radio)  
P. L. Strohschein, B.Sc.  
D. J. Wyer, B.Sc.

Technician - - - - - A. A. Andrech, (Jny. Radio)

Instrumentation Section  
Head - - - - - H. D. Meley, P.Eng., (Jny. Elect.)

Instructors - - - - - G. P. O'Neal  
Technician - - - - - A. J. Weight

Engineering Sciences  
Department Head - - - - - K. Puffer, B.Sc., M.Sc., P.Eng.

Instructors - - - - - F. Williamson, B.Sc., M.Sc., P.Eng.  
H. E. R. Ottley, B.Eng., M.Sc.

Drafting Section Head - - - F. W. Appelt, B.Sc., P.Eng.

Instructors - - - - - C. B. Holubitsky, B. Arch.  
R. E. Juthner  
C. E. Nickel, B.Sc., B.Ed.  
C. E. Schroder, B.Sc.

Gas Section Head - - - - F. H. Babet, B.Sc., P.Eng.

Materials Section Head - - J. A. Wiltshire, B.Sc., P.Eng.  
Instructors - - - - - K. R. Valens, (Sr. Rad. Cert.)  
J. Marvin, B.Sc.

Technician - - - - - F. Kiriaka

Draftsman - - - - - M. Borsos

Laboratory Sciences Department  
Head - - - - - K. Kamra, B.A., B.Sc., P.Eng.,  
M.E.I.C.

#### Chemical Technology Section

Head - - - - - D. E. Wesemann, Dr. Rer. Nat.,  
Dipl. Chem., M.C.I.C.  
Instructors - - - - - B. A. Perrin, B.Sc., I.P.T.C.  
H. M. Publicover, B.Sc., (Chem.,  
B.Sc. Chem. Eng.)  
D. Scraba, B.Sc., B.Ed.  
B. M. Worrall, B.Sc., Ph.D., (Dip.  
Op. Res. Man.)  
Technician - - - - - J. Herold

#### Dental Technology Section

Head - - - - - A. Classen, B.Ed., D.D.S.  
Instructors - - - - - D. Cunningham  
R. Mitchell, (Cert. Dent. Tech and  
Dent. Mech.)  
Mrs. M. C. McRae, R.N.

#### Medical Laboratory Technology Section

Director - - - - - J. Stirratt, B.Sc., M.B., Ch.B., M.D.  
Section Head - - - - - Mrs. D. L. Pronko, B.Sc., R.T.,  
(C.S.L.T.)  
Instructors - - - - - M. F. Cheng, B.Sc., R.T., (C.S.L.T.)  
Mrs. A. J. Oppertshauser, R.T.,  
(C.S.L.T.)  
Special Lecturer - - - - S. Hnatko, B.Sc., M.D., M.A.,  
(Bact.)  
Technician - - - - - Mrs. N. Klink, R.T., (C.S.L.T.)  
Lab Assistant - - - - - Mrs. E. Soos

#### Photographic Technology Section

Acting Section Head - - - R. A. Alexander, Brooks Diploma  
Instructor - - - - - J. R. Kimball, Art. Centre School  
Diploma

#### Physics Section

Acting Senior Instructor - - I. Burn, B.Sc., Physics  
Instructors - - - - - L. Bradshaw, B.A.Sc.  
M. Day, B.Sc.  
A. D. Laplante, B.Sc., M.Sc.  
G. Ward, B.Tech., A.S.A.S.M.,  
A.M.I.E. (AST), A.M. Aus.I.M.M.)  
Technician - - - - - L. Klar

#### X-Ray Technology Section

Director - - - - - M. M. Mallett, M.D., C.M.  
(McGill), Member C.M.A., C.A.R.  
Section Head - - - - - F. J. Callaway, R.T., (C.S.R.T.)  
Instructor - - - - - K. Noden, R.T., (C.S.R.T.)  
Audio-Visual Services - R. Hodgson, Brooks Diploma

#### Mathematics and English

Department Head - - - - N. S. Cameron, B.Sc.  
Instructors - - - - - S. R. Gandhi, B.Sc., M.Sc.  
M. Koslowski, B.A., B.Sc.  
E. Lipsett, B.Sc., P.Geoph.  
F. Lukawitski, B.Sc., M.Sc., Prof.  
Eng.  
M. A. McEachern, B.Sc.  
J. J. Needham, B.Sc.

#### BUSINESS EDUCATION AND VOCATIONAL DIVISION

##### Business Education Department

Head - - - - - - - J. Kauffman, B.Sc.

Instructors - - - - - H. Daum, A.Sc., (Bus.) B.Sc.  
J. H. Edey, B.Ed.  
W. J. Fedorak, R.I.A.  
J. E. Herriott, B.A.  
E. A. Kehler  
Doris P. Murphy  
R. A. North  
J. Nicol  
M. Ethel Oliver  
Juanita E. Perrin  
G. Rose  
J. Weir

#### Vocational Department

Instructors - - - - - Barbering—  
R. Spencer, (Cert. Prof.)  
Beauty Culture—

Milly Vujic, (Cert. Prof.)  
Sewing—G. A. Radicchi

Food Service Department Head N. O. Gibeault, (Jny. Cook)

Food Services Production  
Manager - - - - - G. L. Carscadden  
Instructors - - - - - P. Herrick  
J. Langelo, (Jny. Cook)  
A. W. Munger, (Jny. Cook)  
R. Wroot, (Jny. Baker)

#### APPRENTICESHIP DIVISION

Electrical Department Head - R. G. Proudfoot, M.Sc., P.Eng.  
Section Head - - - - - C. Ayles, (P.I.T.A. Dip.)  
Senior Instructors - - - J. Aanen, (Mech. Eng. Dip.)  
D. Hunchak, B.Sc., (P.I.T.A. Dip.)  
M. Massey-Hicks, (N.T.C. No. III,  
Telephony)  
A. Robbins, (S.A.I.T. Dip., Jny.  
Elect.)

Instructors - - - - - J. L. Antoniuk, (P.I.T.A. Dip., Jny.  
Elect. and Gasfitter)

J. Balombin, B.Sc., P.Eng.  
H. D. Black, (P.I.T.A. Dip.)  
J. K. Clark, (Comm. Tech. Jny.)  
S. Christensen, (P.I.T.A. Dip. Jny.  
Elect.)

R. J. Dovey, B.A.Sc., E.I.T.  
H. Peacock, B.Sc., P.Eng.  
G. J. Purvis, (P.I.T.A. Cert., Jny.  
Ref. Mech.)

H. Robinson, (N. C. Elec.Eng.,  
Jny. Elect.)  
P. Woloshyn, B.Sc., P.Eng.  
S. Worthington, (Eng. Dip. Equiv.),  
(Jny. Elect.)

Electronics Technician - - J. Harasimiuk, (S.A.I.T. Dip.)

Construction Department Head - J. Tewnion, B.Sc., P.Eng., (H.N.C.  
Jny. Bricklayer and Mason)

Senior Instructors - - - C. Bedford, (Jny. P. & D.)  
P. Hartman, (N.H.A. Wood Tech.),  
(Jny. Carp.)

Instructors - - - - - J. Gleerup, (Jny. Bricklayer and  
Mason)  
G. Hasegawa, B.Sc., P.Eng.  
M. McFarlane, (Jny. Bricklayer)  
F. Miller, (P.I.T.A. Dip., Jny. Carp.)  
G. Pezzani, A.S.A. (Jny. P. & D.,  
C. & G. Cert.)  
J. Rickert, (Jny. Carp.)  
J. Wall, (Jny. Pl., C. & G. Cert.)

Automotives Section Head	- - -	E. Ewing, (Jny. M.V.R.T.)	Senior Instructor—	
Instructors	- - - - -	R. Barnes, (Jny. M.V.R.T.)	Industrial Production Tech. -	E. J. Cairns, B.Sc., P.Eng. (Ont.), A.M.I. Mech. E. A.F.R.A.S.
		R. Brown, (Jny. M.V.R.T.)		
		D. Cumming, (Jny. M.V.R.T.) Cert. Auto Weld.		
		D. Erickson, (Jny. A.B.)	Senior Instructor—	H. V. Johnson, (Jny. S.M.)
		W. Graham, (S.A.I.T. Dip.), (Jny. M.V.R.T.)	Sheet Metal	- - - - -
		G. A. Johnson, (Jny. M.V.R.T.)	Instructors	- - - - -
		A. Pols, (Jny. M.V.R.T.)		F. Bergh, (Jny. Stm. & Gasfitter)
		H. Press, (Jny. M.V.R.T., H.D., Weld.)		P. Doucet, (Jny. Pb. & Gasfitter)
		R. Pugh, (Jny. M.V.R.T., H.D.)		J. Good, (Jny. S.M.)
		C. Reeves, (Jny. A.B.), (Jny. M.V.R.T.), Weld. Cert.		P. Merry, (Jny. Weld. & Boilermaker)
		G. B. Sides, (Jny. M.V.R.T.)		F. Methuen, (Jny. Weld. & Mach.)
Heavy Duty Diesel Section Head	R. Reid, (Jny. H.D., M.V.R.T., Weld.)			A. Nixon, (Jny. Mach.)
Senior Instructor	- - - - -	R. Warden, (Jny. H.D.)		W. I. Rankin, (Jny. Stm. Pb. & Gasfitter)
		K. R. Cherniawsky, B.Sc., (S.A.I.T. Dip. Aer. Eng.)		G. L. Scott, (Jny. Pb. & Gasfitter)
		H. Reitmeyer, (Jny. H.D., M.V.R.T.)		G. Smith, (Jny. Weld. & B Cert.)
		V. Riggs, (P.I.T.A. Dip., Jny. H.D.)		R. Sneddon, (Jny. Pb. & Gasfitter)
		H. Zeitner, (Jny. M.V.R.T.)		N. B. Stewart, (Jny. S.M.)
Metals Department Head	- - -	H. N. MacPherson, A.M.I.Mech. E., P.Eng.		E. Wruk, (Jny. Weld. & B Cert.)
Section Head—Welding	- -	V. Campbell, (Jny. Welder & B Cert.)	Technician	- - - - -
Section Head—Piping Trades	P. Trott, (H.N.D.), P.Eng.			M. P. Kopat, (Jny. Mach. & Toolmaker)
			Related Subjects Head	- - - - -
			Instructors	- - - - -
				C. S. Hill, B.Sc., M.Sc., (Prof. Cert.)
				W. Babiy, B.Sc., (Civ.), Aero. Eng. Dip.
				T. W. Broad, (Jny. M.V.R.T.)
				H. V. Clendenning, (Jny. Carp.)
				M. D. O'Connor, M.I.M.L.T.
				L. Siega, B.Sc., (Geol.)

# ADVISORY COMMITTEES

The basic concern of all Vocational Training Institutions is that its graduates are provided with employable skills required by specific areas of industry, business and government. It is important to note that all programs, facilities and activities of the Institute are being developed through the closest possible co-ordination with those who can best insure the success of this aim, the employers themselves.

By authority of the Minister of Education, Advisory Committees have been organized for most of the Institute courses. These committees act as a liaison between industry and the Institute, advise with respect to curriculum and course content, and foster interest in industry for graduates of the courses.

We are deeply indebted to the individuals of all committees and the companies which they represent for the invaluable assistance they have rendered to us. The following committees are presently in operation:

## ARCHITECTURAL TECHNOLOGY

G. B. McAdam (Chairman), Rule, Wynn & Rule, Architects, Calgary  
G. R. Beatson, Assoc. Haddin, Davis & Brown Ltd., Calgary  
K. L. Bond, Clayton, Bond and Mogridge, Architects, Calgary, Alberta  
J. A. Cawston, J. A. Cawston & Associates, Calgary, Alberta  
A. Dale, A. Dale and Associates, Calgary  
K. Eggenberger, J. H. Cook and Associates, Calgary  
W. G. Hames, Rule, Wynn & Rule, Architects, Calgary  
H. A. Henderson, Edmonton  
G. D. Menzies, Dept. of Public Works, Edmonton  
W. G. Milne, Calgary  
H. Seton, K. C. Stanley & Co., Architects, Edmonton  
J. K. Shadden, Blais and Shadden, Calgary  
D. S. Stevens, J. Stevenson and Associates, Calgary

## BANKING

P. Chemago, Special Representative, Toronto-Dominion Bank  
J. F. D. Haskell, Assistant Manager, Bank of Montreal  
D. L. Lindsay, Manager, Bank of Nova Scotia  
B. Robinson, Manager, Business Development Dept., Royal Bank of Canada  
L. Roy, Manager, Business Development Dept., Canadian Imperial Bank of Commerce  
L. Simonson, Manager, Provincial Treasury Branch  
F. G. Stewart, Deputy Provincial Treasurer

## CHEMICAL TECHNOLOGY

Col. E. H. Parsons (Chairman), Director of Industrial Development, Calgary Power Ltd., Calgary  
W. A. Flook (Vice-Chairman NAIT), Operations Control Department, Canadian Chemical Co. Ltd., Edmonton  
A. M. Pennie (Vice-Chairman SAIT), Chief Superintendent, Suffield Experimental Station, Ralston  
R. E. Alston, Superintendent of Laboratories, Northwest Chemical Co. Ltd., Medicine Hat  
Dr. T. H. Anstey, Canada Dept. of Agriculture, Research Station, Lethbridge  
J. N. Bowersock, Technical Superintendent, Northwestern Pulp and Power Ltd., Hinton  
J. Claessen, Chief Chemist, Canadian Industries Ltd., Polythene Plant, Edmonton  
A. Fitzpatrick, Industrial Engineer, Research Council of Alberta, Edmonton  
Dr. J. D. Frame, \* Cities Service Athabasca Inc., Edmonton  
S. T. Jones, Superintendent, Canadian Industries Ltd., Polythene Plant Edmonton  
J. Melville, Superintendent of Development, Alberta Nitrogen Department, Consolidated Mining and Smelting Co. of Canada Ltd., Calgary  
J. E. Oberholtzer, Deputy Minister, Department of Industry and Development, Edmonton  
Dr. D. B. Robinson, Head, Department of Chemical and Petroleum Engineering, University of Alberta, Edmonton  
M. A. Schenning, Head, Production Services Department, Sherritt-Gordon Mines Ltd., Fort Saskatchewan  
\*Research Director

## CIVIL TECHNOLOGY

### SOILS, ASPHALT AND CONCRETE SUB-COMMITTEE

J. M. Dacyszyn, Materials Engineer, Department of Highways, Edmonton  
E. L. Fowler, Associate Professor, Department of Civil Engineering, University of Alberta, Edmonton  
B. W. Kathol, Testing Engineer, Department of Highway Laboratory, Edmonton

#### **FLUID MECHANICS SUB-COMMITTEE**

R. E. Bailey, Chief Engineer, Department of Agriculture, Edmonton  
W. Bailey, Municipal Engineer, Department of Public Health, Edmonton  
P. H. Boutilier, Associate Professor, Department of Civil Engineering, University of Alberta, Edmonton  
A. W. Peterson, Associate Professor, Department of Civil Engineering, University of Alberta, Edmonton  
P. H. Boutilier, Associate Professor, Department of Civil Engineering, University of Alberta, Edmonton  
A. W. Peterson, Associate Professor, Department of Civil Engineering, University of Alberta, Edmonton

#### **COMMERCIAL COOKING**

R. K. Mottishaw (Chairman), Manager, The Carolina, Calgary  
L. F. Borchert, Manager, Swift Canadian Co. Ltd., Calgary  
H. C. Craig, Java Shop, Fort Macleod  
J. H. Crichton, Assistant Public Health Inspector, Dept. of Public Health, Calgary  
Sven Erickson, Taber, Alberta  
H. E. Homan, Assistant Deputy Minister, Dept. of Public Health, Edmonton  
Miss Helen Jacobson, Chief Dietician, General Hospital, Calgary  
L. C. Parkinson, Manager, Empress Hotel, Victoria, B.C.  
Mrs. G. Paulson, Calgary Labour Council, Labour Temple, Calgary  
E. Peters, Calgary Caterers Ltd., Calgary  
M. R. Ross, Executive Secretary, Associated Hospitals of Alberta, Edmonton  
J. W. Sarchuk, Manager, St. Louis Hotel, Calgary  
F. Wattam, Starlight Room, Royal Hotel, Calgary

#### **DENTAL HEALTH PROGRAMS**

Dr. H. R. MacLean (Chairman), Dean, Faculty of Dentistry, University of Alberta, Edmonton  
Dr. S. G. Geldart, Clinical Director, Faculty of Dentistry, University of Alberta, Edmonton  
Dr. C. W. B. McPhail, Head Preventive and Public Health Dentistry, University of Alberta, Edmonton

#### **DRAFTING TECHNOLOGY**

T. Lamb (Chairman), General Manager, Structural Engineering Services Ltd., Calgary  
D. M. Barclay, Chief Draftsman, Structural Section, Dominion Bridge Co. Ltd., Calgary  
J. H. Blair, Area Supervisor, Survey Drafting, Shell Oil Co. of Canada Ltd., Calgary  
A. H. Nicholson, City Engineer, City Hall, Calgary  
G. H. Pilbrow, Calgary Structural Steel Ltd., Calgary  
N. Sanford, Chief Draftsman, Canadian Western Natural Gas Company, Ltd., Calgary  
Dr. J. C. Sproule, J. C. Sproule and Associates, Calgary  
W. Taylor, Supervisor, Drafting and Reproduction, B.A. Oil Co. Ltd., Calgary  
J. T. Ward, Civil Engineering, Producing Department, Imperial Oil Limited, Calgary

#### **GAS TECHNOLOGY**

Dr. M. D. Winning (Chairman), Area Gas Engineer, Shell Oil Co. of Canada Limited, Calgary  
E. Berlie, Assistant Manager, Texas Gulf Sulphur Company (Inc.), Calgary  
J. B. Corbet, Manager, Alberta Division, Canadian Petroleum Association, Calgary  
S. McGehee, The California Standard Company, Calgary  
J. Maybin, Canadian Western Natural Gas Company Limited, Calgary  
W. J. Sage, Assistant Division Production Superintendent, Imperial Oil Limited, Edmonton

#### **HEAVY DUTY EQUIPMENT TECHNOLOGY**

J. A. Angus, Vice-President, R. Angus (Alberta) Ltd., Edmonton  
L. G. Bussard, Assistant Highways Shops and Equipment Director, Department of Highways, Edmonton  
G. N. Campbell, Supervisor, Industrial Sales, Northwestern Utilities, Limited, Edmonton  
A. J. Cressey, Executive Vice-President, Banister Construction Co. Ltd., Edmonton  
D. Farrugia, General Superintendent, W. C. Wells Construction Co. Ltd., Edmonton  
D. Panar, Associate Professor, Department of Mechanical Engineering, University of Alberta, Edmonton  
C. H. Pardee, President and General Manager, Pardee Equipment Ltd., Edmonton

## INDUSTRIAL ELECTRICAL TECHNOLOGY

H. Randle (Chairman), Engineer, Equipment and Waterworks Department, Calgary Power Ltd., Calgary

J. B. Corbet, Manager, Alberta Division, Canadian Petroleum Ass'n., Calgary

R. S. Crawford, City and District Plant Superintendent, Alberta Government Telephones, Calgary

F. Crosby, Northern Electric Co. Ltd., Edmonton

M. Eagle, Pioneer Electric, Red Deer

G. Flavell, Manager, Apparatus Sales, Canadian Westinghouse, Calgary

A. E. Gudmundson, Superintendent, Transmission and Distribution, Canadian Utilities Ltd., Edmonton

S. J. Hampton, Chief Electrical Engineer, Electric Light and Power Department, City of Edmonton, Alberta

W. Lawrence, Engineer, Electrical Contracting and Machinery, Calgary

G. W. Lawson, Chief Electrical Inspector, Department of Labour, Edmonton

W. F. McMullen, Engineering Personnel Manager, Apparatus Department, Canadian General Electric Co. Ltd., Peterborough, Ontario

R. J. B. McNally, Plant Engineer, Northwest Nitro-Chemicals Ltd., Medicine Hat

C. E. McNiven, Alberta Nitrogen Division, Consolidated Mining and Smelting, Calgary, Alberta

K. H. Rapsey, Vice-President and General Manager, Allen-Bradley Canada Ltd., Galt, Ontario

G. Sutfin, City Electric Light Department, Calgary, Alberta

H. D. Tims, Plant Engineer, Imperial Oil Ltd., Calgary

E. G. Willis, Haddin, Davis and Brown Ltd., Calgary

E. W. Wirtanen, President, Wirtanen Electric Co. Ltd., Edmonton

## INDUSTRIAL PRODUCTION TECHNOLOGY

G. T. Henderson, Plant Manager, Dominion Bridge Co. Ltd., Edmonton

C. W. Johnson, Edmonton Division Manager, Barber Machinery Ltd., Edmonton

A. R. Nelson, Manager, Curtis Hoover Ltd., Edmonton

## INSTRUMENTATION

H. K. Colling, ARCS, P.Eng., Vice-President and Resident Manager, Northwest Pulp & Power Ltd., Hinton

N. R. Dunne, Division Mechanical Engineer, Shell Oil Co. Ltd., Edmonton

R. N. Forbes, Branch Manager, Bailey Meter Co. Ltd., Edmonton

W. D. Gallon, Instrument Engineer, Interprovincial Pipe Line Co., Edmonton

J. J. Maxwell, Instrument Engineer, Sherritt-Gordon Mines Ltd., Ft. Saskatchewan

M. J. Ozubko, Supervisor of Electrical and Instrument Engineering, Canadian Chemical Co. Ltd., Edmonton

R. Phillips, Instrument Foreman, Imperial Oil Limited, Edmonton

Dr. R. A. Ritter, Associate Professor, Department of Chemical and Petroleum Engineering, University of Alberta, Edmonton

M. F. Salm, Measurements Engineer, Northwestern Utilities, Ltd., Edmonton

L. E. Snell, Gas Engineer, Imperial Oil Limited, Producing Department, Edmonton

D. G. Turnbull, Branch Manager, The Foxboro Company Limited, Edmonton

## MATERIALS TECHNOLOGY

N. Malychuk, Supervisor of Engineering, Alberta Phoenix Tube and Pipe Ltd., Edmonton

A. Palynchuk, Plant Manager, Alberta Phoenix Tube & Pipe Ltd., Edmonton

Dr. J. G. Parr, Professor of Metallurgy, Department of Mining and Metallurgy, University of Alberta, Edmonton

## MEDICAL LABORATORY TECHNOLOGY

Dr. R. E. Bell (Chairman), Director, Department of Clinical Laboratory Services, University of Alberta Hospital, Edmonton

Dr. D. J. Campbell, Hospital Biochemist, University of Alberta Hospital, Edmonton

Dr. P. W. Davey, Director of Laboratories, Royal Alexandra Hospital, Edmonton

Dr. S. Hanson, Director of Laboratories, Edmonton General Hospital, Edmonton

Dr. G. R. Macdonald, Medical Director, Misericordia Hospital, Edmonton

Miss J. Matheson, Instructress, University of Alberta Hospital Training School for Medical Technologists, Edmonton

Dr. P. B. Rose, Director, Division of Medical Services, Department of Public Health, Edmonton

Dr. R. D. Stuart, Director, Provincial Laboratories, University of Alberta, Edmonton

## **OFFICE MACHINE REPAIR**

G. K. Bird, Manager, Remington-Rand, Edmonton  
R. Jenkins, Manager, Smith-Corona Typewriters, Edmonton  
G. Kellam, Manager, H. J. Kellam Limited, Edmonton  
V. Mahoney, Manager, Universal Typewriter Limited, Edmonton  
F. W. Robinson, Manager, Underwood-Olivetti Limited, Edmonton  
N. Whittal, Manager, Royal Typewriters, Edmonton  
L. Wood, Branch Manager, Warwood Office Equipment Ltd., Edmonton

## **PHOTOGRAPHIC TECHNOLOGY**

B. C. Hollingshead, Manager, McDermid Studios Ltd., Edmonton  
K. Hutchinson, Film Commissioner, Department of Industry and Development, Edmonton  
D. Miller, David Miller Photography, Edmonton  
E. W. Zimmerman, Technical Representative, Canadian Kodak Sales Limited, Calgary

## **REFRIGERATION AND AIR CONDITIONING TECHNOLOGY**

D. C. W. Bell, A. L. Brews and Son Ltd., Calgary  
P. Butler, President, Angus and Associates Ltd., Edmonton  
R. T. Crawford, Manager, Calgary District, Canadian Ice Machine Co. Ltd., Calgary  
W. Dowling, Dowling Electric and Refrigeration Service, Calgary  
H. Haughton, Manager, Weathermakers Limited, Edmonton

H. Hole, Manager, Lockerbie & Hole Western Ltd., Edmonton

J. P. Kearns, Service Manager, Bruce Robinson Electric Ltd., Calgary

D. E. A. MacKay, Managing Director, Crowther, MacKay and Associates Ltd., Calgary

J. C. Meier, Supervising Mechanical Engineer, Department of Public Works, Edmonton

G. T. Narfason, Trane Co. of Canada Ltd., Calgary

J. P. Patterson, Branch Manager, Johnson Controls Ltd., Calgary

R. Rahme, Carrier Engineering Ltd., Calgary

G. W. Sadler, Associate Professor, Department of Mechanical Engineering, University of Alberta, Edmonton

E. Schaffer, Fred Deeves and Sons Ltd., Calgary

E. Tardiff, Werner's Refrigeration Co. Ltd., Calgary

W. R. Tinkness, Honeywell Controls Ltd., Calgary

B. Watson, Trotter and Morton Ltd., Calgary

D. R. Wheeler, Chief Application Engineer, Lennox Industries (Canada) Ltd., Calgary

## **X-RAY TECHNOLOGY**

Dr. P. B. Rose (Chairman), Director, Division of Medical Services, Department of Public Health, Edmonton

Dr. R. M. Clare, Medical Administration, Edmonton General Hospital, Edmonton

Dr. H. E. Duggan, Professor of Radiology, University of Alberta, Edmonton

Dr. M. Mallett, Radiologist, 540 Tegler Building, Edmonton, Director, Medical X-ray Technology Training, N.A.I.T.

# ADMISSION REQUIREMENTS

## 1. TECHNOLOGY DIVISION

A. Preference will be given in the following courses to applicants who have a minimum of 100 Alberta High School credits or equivalent including at least a B standing in Math. 30 or 32, Science 20 and English 20.

### Two-Year Courses

(i) Architectural Technology	(vi) Gas Technology
(ii) Chemical Technology	(vii) Industrial Electrical Technology
(iii) Civil Technology	(viii) Instrumentation Technology
(iv) Drafting Technology	(ix) Materials Technology
(v) Electronic Technology	

B. Preference will be given in the following two-year courses to applicants who have a minimum of 67 Alberta High School credits or equivalent, including at least a B standing in Math. 20 or 22, Science 20 and English 20.

- (i) Heavy Duty Equipment Technology
- (ii) Photographic Technology
- (iii) Industrial Production Technology
- (iv) Refrigeration and Air Conditioning Technology

C. Students wishing to enroll in MEDICAL LABORATORY TECHNOLOGY must have as a minimum Senior Matriculation (Alberta) or its equivalent with credits in Mathematics 30, Chemistry 30 and an overall average of at least 60%.

D. Students wishing to enroll in X-RAY TECHNOLOGY must have as a minimum a High School Diploma with a B standing in an aggregate total of 75 credits including Science 20, Mathematics 20, Biology 32 and Physics 30 are desirable although not mandatory.

E. Preference will be given in the following courses to applicants who have a minimum of a High School Diploma (or equivalent) including at least a B standing in Math. 30 or 32, Science 20 and English 20.

- (i) Dental Technician
- (ii) Dental Mechanic

F. Preference will be given to applicants for enrolment in the following course who have a minimum qualification of Grade XI including at least a B standing in Math. 20 or 21, Science 20 and English 20.

- (i) Dental Assistant

## 2. BUSINESS EDUCATION AND VOCATIONAL DIVISION

A. Preference will be given to applicants for enrolment in the following courses who have a minimum qualification of a Grade XII Diploma.

- (i) Business Administration
- (ii) Banking
- (iii) Data Processing Machine Operator's Course
- (iv) Secretarial
- (v) Distributive Education

B. Preference will be given to applicants for enrolment in OFFICE MACHINE REPAIR who have a minimum qualification of Grade XI.

C. Preference will be given to applicants for enrolment in the COMMERCIAL COOKING AND RESTAURANT OPERATION COURSE who have a minimum of 35 Alberta High School credits or equivalent.

### D. Short Courses

FOOD SALES AND SERVICE (waiter-waitress training). At least a Grade IX background is preferred.

## 3. TRADE TRAINING DIVISION

### A. Pre-Employment Courses

Construction	Grade IX or equivalent
Commercial Sign Writing	Grade X or equivalent
Factory Woodworking	Grade X or equivalent
Radio	Grade X or equivalent
Welding	Grade IX or equivalent

## B. Apprentice Training

This training is only available to apprentices who are registered in Alberta. For complete details concerning Apprenticeship Training, write to the Director of Apprenticeship, Department of Labour, Edmonton, Alberta. DO NOT WRITE TO THE INSTITUTE FOR THESE DETAILS.

## 4. NIGHT DIVISION

The Evening Division will commence during the third week of September and will cover approximately 70 different courses. A separate night calendar will be available on the 1st of June, 1964.

## PREREQUISITE EQUIVALENTS

For the benefit of those applicants who were educated in British Columbia, Saskatchewan or Manitoba, the following approximate equivalents are suggested:

ALBERTA	BRITISH COLUMBIA	SASKATCHEWAN AND MANITOBA
Mathematics 10	Mathematics 20	°°Grade X Mathematics
Science 10	Science 20	Grade X Science
*English 20	English 30, 31, 32, 40, 91 or 93	Grade XI English
Mathematics 20	Mathematics 91 or 30	°°Grade XI Mathematics
Science 20	Physics 91 and Chemistry 91	Grade XI Physics and Chemistry
Social Studies 20	Social Studies 30, 31, 32, 33	Grade XI Social Studies
Mathematics 30	Mathematics 101	°°Grade XII Mathematics

\*This course includes both Language and Literature

°°These courses must include both Algebra and Geometry

**NOTE:** British Columbia applicants in the University Program of studies will be given preference over those in the General Program. Complete Grade XIII is equal to about 120 Alberta High School credits. No credits are given for B.C. Grade IX. Complete Grade XII in Manitoba and Saskatchewan is equal to about 105 Alberta High School credits.

# ENTRANCE REQUIREMENTS EFFECTIVE SEPTEMBER 1965

All Principals, Teachers, Guidance Counselors and students take note that there will be substantial changes in the entrance requirements for the Institute Courses noted below. The new requirements will be effective for the school year commencing in September, 1965.

## Group I

The major change herein, is the addition of a third year to the Technology courses listed below. Please refer to the diagram and notes on the following page.

Architectural Technology  
Drafting Technology  
Electrical Technology  
Electronic Technology  
Instrumentation Technology  
Production Technology  
Refrigeration and Air Conditioning Technology

## Entrance Requirements for the above:

**Admission to year "A"—**Preference will be given to students having 67 Alberta High School credits with at least a "B" standing in Mathematics 20 or 22, Science 20 or 22, and English 20.

**Admission to year "B"—**Preference will be given to applicants who have an Alberta High School Diploma (or equivalent) with at least a "B" standing in Mathematics 30 or 32, 35 or more credits in one of the articulated Vocational High School subjects with at least a "B" standing in the final year, and credit in Physics 30 or 32 OR successful completion of Year A.

Group II (non-articulated)

A—Civil Technology  
Gas Technology  
Materials Technology

**Entrance Requirements**

Preference will be given to applicants who have a minimum qualification of a High School Diploma or equivalent, with at least a "B" standing in Mathematics 30 or 32 and credit in Physics 30 or 32.

B—Chemical Technology

**Entrance Requirements**

Preference will be given to applicants who have a minimum qualification of a High School Diploma or equivalent, with at least a "B" standing in Mathematics 30 or 32 and credit in Chemistry 30.

C—Dental Mechanic  
Dental Technician

**Entrance Requirements**

An Alberta High School Diploma.

D—Medical Laboratory Technology  
X-ray Technology

**Entrance Requirements**

Alberta Matriculation or its equivalent, with credits in Mathematics 30 and/or 31, Chemistry 30, Physics 30 and/or Biology 32 and an overall average of at least 60%.

E—Heavy Duty Technology  
Photographic Technology

**Entrance Requirements**

Preference will be given to applicants with a minimum of 67 High School credits (or equivalent) including at least a "B" standing in Mathematics 20 or 22, Science 20 or 22 and English 20.

F—Dental Assistant

**Entrance Requirements**

Students must have at least 67 High School credits including a "B" standing in Mathematics 20 or 21, Science 20 or 22 and English 20 (or equivalent) with preference given to those who have a High School Diploma.

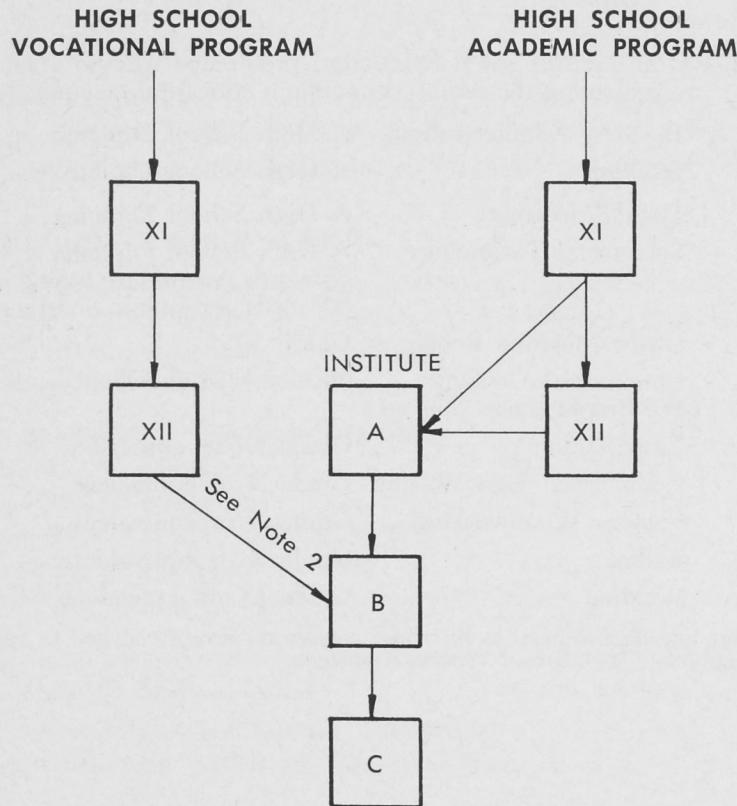
**NOTE**—In all courses listed hereunder, preference will be given to those having the required minimum education or equivalent.

*Business Administration	A High School Diploma
*Banking	A High School Diploma
*Data Processing	A High School Diploma
*Secretarial Technology	A High School Diploma 35 words per minute typing and 80 words per minute Shorthand
Office Machine Repair	Grade XI
Commercial Cooking	35 Alberta High School credits
Pre-Employment Courses	
Construction	Grade IX or equivalent
Commercial Sign Writing	Grade X or equivalent
Factory Woodworking	Grade X or equivalent
Radio	Grade X or equivalent
Welding	Grade IX or equivalent

\*Students intending to enrol in the above courses are strongly advised to follow the appropriate High School Vocational program.

## IMPORTANT STATEMENT CONCERNING THE ENTRANCE REQUIREMENTS TO THE ARTICULATED TECHNOLOGIES

A new relationship will become effective September, 1965, between certain industrial vocational programs offered in Alberta High Schools and their related technologies offered in the Alberta Institutes of Technology. Details are as follows:



Entrance requirements for Year A are: 67 Alberta High School credits with at least a "B" standing in Mathematics 20 or 22, Science 20 or 22, and English 20.

Entrance requirements for entry into Year B are: an Alberta High School Diploma with at least a "B" standing in Mathematics 30 or 32, 35 or more credits in one of the articulated Vocational High School subjects (see Note 1 below) with at least a "B" standing in the final year, and credit in Physics 30 or 32, OR successful completion of Year A (see Note 2 below).

### NOTE 1

This route applies to the following Vocational High School programs and Institute technologies:

FROM This High School Voc. Program	TO the Second Year (Year B) in This Institute Program
Electricity 12, 22, and 32	Electrical Technology OR Refrigeration and Air Conditioning Technology
Drafting 12, 22, and 32	Architectural Technology OR Drafting Technology
Carpentry 12, 22, and 32	Construction Technology (SAIT only)
Machine Shop 12, 22, and 32	Mechanical Technology (SAIT only) OR Production Technology (NAIT only)
Electronics 12, 22, and 32	Electronics Technology OR Instrumentation Technology (NAIT only)

### NOTE 2

Priority for entry into Year A will be given to students from schools where the industrial vocational program is not available. Students attending schools where the relevant vocational program is offered will be expected to prepare themselves for direct entry into Year B.

# GENERAL REGULATIONS

## ADMISSION RULES

1. All prospective students must be 16 years of age or over.
2. Prospective students are urged to submit applications to the Registrar well in advance of course opening dates to avoid disappointment. However, no applications should be submitted before January 31 of the year in which admittance is desired.
3. EACH APPLICATION MUST BE ACCOMPANIED BY THE \$5.00 REGISTRATION FEE, AND EITHER A TRANSCRIPT SHOWING THE NECESSARY HIGH SCHOOL CREDITS AND GRADES OR THE STATEMENTS FROM THE EXAMINATIONS BOARD SHOWING ALL CREDITS TO DATE. STUDENTS WRITING THE JUNE OR SUPPLEMENTAL EXAMINATIONS MUST FORWARD THEIR RESULTS AS SOON AS THEY ARE RECEIVED. SEE PAGE 17 FOR THE EDUCATIONAL PREREQUISITES FOR EACH COURSE.
4. In any course, the Institute reserves the right to accept only those applicants who appear to have the capabilities necessary for success in the course. When the number of applicants exceeds the accommodation available, those with the highest qualifications will be given preference.
5. All students who have been accepted for any course are expected to be in attendance on the opening date as shown in the Calendar on Page 8, unless they have been granted permission by the Principal to enter at a later date. All enrolling students must appear at the Institute, or clarify their intentions by letter or wire, before noon of the day of registration, otherwise their position may be forfeited to someone else should the course be fully enrolled. The importance of the preliminary instruction in any course cannot be emphasized too strongly.
6. The Institute reserves the right to cancel any course in cases where the enrolment does not warrant its being offered.

## ACADEMIC RULES

1. The Institute will issue Diplomas to all students who have successfully completed a regular day course of at least two years' duration, who have been in attendance for at least 90% of the possible number of hours of the Course, and who have obtained a minimum standing of 2.00 Grade Points in each and every unit of the Course.
2. Advancement from Quarter to Quarter.
  - (a) Students who obtain a Grade Point average of less than 1.55 in the first Quarter may be asked to withdraw, all others with a Grade Point average of less than 2.00 will be advanced to the Second Quarter, on probation, and must improve their Grade Point average to not less than 1.75 in the next Quarter in order to be permitted to enter the subsequent Quarter.
3. (a) A student who fails in subjects whose combined Course Credits exceed one-third of the total Course Credits is considered to have failed and will not be permitted supplemental examinations.
  - (b) A student who fails the year may be permitted to repeat provided he has obtained a pass mark in subjects whose combined course credits are equal to or exceed one-half of the total course credits for the year, and provided the year he wishes to repeat is not fully enrolled with qualified students.
  - (c) A student who fails in subjects whose combined course credits are equal to or less than one-third of the total course credits, will be permitted to write supplemental examinations.

## SUPPLEMENTAL EXAMINATIONS

1. (a) Supplemental examinations will be held within three weeks after the quarterly examinations, or as determined by the Institute.
2. (a) A student who fails supplemental examinations in subjects whose combined course credits exceed one-fifth of the course credits is considered to have failed the year, but may be

permitted to repeat provided the year he wishes to repeat is not fully enrolled with qualified students.

- (b) A student who fails supplemental examinations in subjects whose combined course credits are equal to or less than one-fifth of the total course credits may be permitted into the second year, but will be placed on probation until the results of the fourth quarter examinations are known. If these results are considered unsatisfactory, such a student may be asked to withdraw.
- (c) A student who is not in his final year and fails in any subject and does not write that supplemental examination is considered to have failed the year, but may be permitted to repeat provided the year of the course he has failed is not fully enrolled with qualified students.

#### **MATHEMATICS AND SCIENCE TEST**

As soon after the commencement of the course as it can be arranged, the students registered in the first year of the Technology Courses will be required to write a test in Mathematics and Science.

All applicants who have been accepted for any of the courses listed above are urged to review their high school mathematics (plus arithmetic) and science before commencing the course for which they have registered at the Institute.

#### **ACCREDITATION FOR HIGH SCHOOL COURSES**

Students who have successfully completed a unit shop subject (Automotive, Electrical, Metal, Woodwork) in Grades X, XI and XII of the Alberta High School Course with a minimum of Grade 'A' standing may receive credit for the first year of the comparable two-year course at the Institute and may register in the second year of the course. Claims for such credit must be supported by documentary evidence to be submitted when making application for the course.

#### **QUARTER SYSTEM**

The Institute operates on the quarter system. The school year is divided into three quarters, each composed of fifty instructional days exclusive of holidays, giving a total of three hundred instructional hours in each quarter. Examinations are held after each quarter.

#### **GRADES**

The Grade Point System will be used for the purpose of grading all examinations as follows:

4 grade points represent	80 - 100%
3.5 grade points represent	75 - 79%
3 grade points represent	70 - 74%
2.5 grade points represent	65 - 69%
2 grade points represent	60 - 64%
1.5 grade points represent	55 - 59%
1 grade point represents	50 - 54%

All examinations will be graded in multiples of 5 from 50% to 80%. All marks of 4 and above will be graded in tenths. Each subject of the course, lecture and lab, will be assigned a specific number of credits in accordance with the following rule: One credit for each lecture hour and one credit for each lab hour per week. Thus to arrive at a figure representing the total Grade Point Credits assigned for each subject of a course, apply the formula Grade X Course Credit equals total Grade Points. The Grade Point average for all subjects would then be computed by dividing the total grade point credits by the sum of the total course credits.

#### **EQUIPMENT AND TOOLS**

While the Institute provides all machine tools and special equipment, students in the various courses are required to provide their own hand tools, drafting instruments, shop clothing, textbooks, etc. Students are advised not to purchase this equipment until they have met the various instructors and have been advised by them as to the quality of tools, etc., which is desirable to obtain.

#### **DISCIPLINE AND ATTENDANCE**

Day classes are held at the Institute from 8:15 a.m. to 4:15 p.m. five days per week throughout the school year. Punctuality and regularity in attendance are expected of all students. Any student who is persistently late for classes may be suspended. Any student who wilfully absents himself from any class for which he is enrolled automatically debars himself from the privileges of the Institute. If a student's progress becomes unsatisfactory, he may be barred from participation in any extra-curricular activities.

All students are trusted to conduct themselves in a manner conducive to the development of a good school spirit. Defacement of buildings and wilful damage to equipment are considered as serious offences. Students are expected to be neatly dressed when attending classes.

Any student whose ability to profit by a selected course is shown to be inadequate, or whose conduct is not in the best interests of the Institute, or whose diligence is such that he will make a failure of his year, may be asked to retire at any time. In such case no portion of the fee other than the tool deposit will be refundable.

Students must attend all classes in related work in the department in which they enroll unless other arrangements have been made with the Principal. Students who obtain such special authorization must advise the Department Head prior to starting classes.

In addition to the work done in school hours each student is expected to devote a minimum of ten hours per week to home study. This time should be planned so as to do justice to all the subjects of the course.

In all Institute premises, the consumption of alcoholic beverages and gambling are prohibited. Violators of this regulation will be suspended or expelled.

## **INSURANCE**

At the time of registration, students pay an insurance fee which entitles them to coverage against accidental injury whilst engaged in Institute supervised activities. The rate has not been established at this time but will be available on registration day. This insurance does not apply to apprentices who are covered under the Workmen's Compensation Board.

## **EXTRA-CURRICULAR ACTIVITIES**

In the modern industrial world technical knowledge and manipulative skills alone are not sufficient to ensure success. Certain personal qualities such as integrity, dependability, initiative, co-operation, the ability to work with and for others, courtesy, etc., are expected from employees who look for promotion.

To encourage the development of these desirable personal qualities the Institute will have a Students' Association under whose auspices many varied extra-curricular activities will be organized. These activities will include social, literary, musical and athletic. They will be planned and carried through under student leadership with the advice of one or more members of the staff who act as sponsors. By means of the business meetings of the Students' Council, a sound training will be given in the correct conduct of public meetings.

## **STUDENT SERVICES**

The overall aim of the Student Services Department is to promote and maintain the physical, moral and mental well-being of the students at N.A.I.T. We also hope to promote personal qualities such as integrity, dependability, initiative, courtesy, co-operation and an insight into the mechanics of group action. All the above qualities are necessary for success in the world of work and it is hoped they may be accomplished through student participation in one or more of the five areas listed below.

### (1) The Physical Education Service Program.

All First Year students enrolled in the Business and Vocational and Technology courses are required to take two hours of physical education per week. Exemption will be allowed for students presenting a medical certificate declaring them unfit to participate.

Individual lockers, locks, towels and shower facilities are available for all students.

The prescribed gymnasium costume is:

### **WOMEN**

Shorts—Dark Blue  
T-Shirts—White  
Socks—White  
Running Shoes—White

### **MEN**

Shorts—Dark Blue  
T-Shirts—White  
Socks—White  
Running Shoes

Numbered and Crested shorts and T-shirts may be purchased at the physical education stores for the following approximate prices:

**WOMEN**

Shorts—\$2.00  
T-Shirt—\$1.40

**MEN**

Shorts—\$1.60  
T-Shirt—\$1.40

**(2) Inter-Departmental Athletics.**

An organized program of inter-departmental competition in activities such as touch football, basketball, badminton, bowling, golf and archery.

**(3) Inter-School Athletics.**

At present we are attempting to enter a league which would provide competition on the junior college level in both major and minor sports.

**(4) Individual Program.**

This program will be carried on in close co-operation with school guidance and health officers. It will be designed to meet the needs of students deviating from normal health or having personal or academic problems. This individual program will be supplemented by Chaplain service being set up in the school.

**(5) School Clubs and Special Interest Activities.**

The focus of this area is the Students' Association centered around which are many diverse activities such as the Yearbook, Newspaper, NAIT Radio, Drama Club, Art Club and other special interest activities.

Complementing the above are the Departmental Clubs which encompass students from a particular Department and work in close co-operation with interested staff sponsors to foster things such as professional growth, social activities and athletics on an inter-departmental level.

**FEES**

(A) Registration—A registration fee of \$5.00 must accompany all applications for enrolment.

(B) All other fees payable to the Institute as set out hereunder shall be paid at the time of enrolment.

	9 or 8-month Courses which incl. Welding	Day Courses over 10 weeks	Short Day Course 10 weeks or less or 300 hours	Welding—6 weeks	Welding—3 weeks
Registration	\$ 5.00	\$ 5.00	\$ 5.00	\$ 5.00	\$ 5.00
Tuition	40.00	25.00	13.00	86.00	43.00
Tool Deposit	5.00	5.00	5.00	5.00	5.00
Lab or Shop	5.00	5.00	2.00	2.00	2.00
Students' Association	17.00	17.00	2.00	2.00	2.00
Ins. and Misc.	2.00	2.00	2.00	2.00	2.00
	<hr/> \$74.00	<hr/> \$59.00	<hr/> \$29.00	<hr/> \$102.00	<hr/> \$59.00

**(C) Fees for Supplemental Examinations.**

Where supplemental examinations covering the work for the entire year are necessary, the fee will be \$3.00 per examination. Where supplemental examinations are given which are required at the termination of a quarter's work, the fee will be \$1.00 per written examination.

(D) Refunds—The tool deposit of \$5.00 less deductions, if any, will be returned upon completion of the course. Tool deposits not claimed within sixty days after the close of the course are not recoverable.

Students who voluntarily withdraw from a day course, either for compassionate or other reasons, may receive a refund of their fees. The refund will be on a percentage basis according to the reason for withdrawal and the period of enrolment. Compassionate reasons for withdrawal will be considered in terms of sickness,

accident or fatality as it directly affects the welfare of the student. The period of enrolment will be the inclusive calendar days counted from the day the course officially commenced until the date of withdrawal. Students who are requested to withdraw from a course for reasons of discipline, automatically forfeit any right to a refund under this section.

**Board and Lodging**—There are no dormitories connected with the Institute. Students may obtain board and room in the vicinity of the campus at a reasonable rate. A list of boarding houses may be obtained from the Main Office on Registration Day. Board and room will cost from \$65 to \$75 per month.

**Railway and Bus Transportation**—Students planning to attend the Institute are advised to contact their local railway or bus ticket agent with respect to the special rates which are available to students.

**The Students' Assistance Act**—Under provisions of this Act, the Alberta Provincial Government has made available to bona fide residents of Alberta a system of loans and grants to assist in attending full-time day courses at the Institute. The maximum loan available is \$900. Grants, in the form of partial remission of loans, are available to those who have shown superior accomplishment in their studies.

Applications may be made either to the Registrar or to the Secretary, Students' Assistance Board, Department of Education, Edmonton.

## SCHOLARSHIPS

Through the generosity of various business firms, organizations, and individuals, and their interest in the work of the Institute, a number of scholarships and awards are being made available to students of this Institute. We regret that the details are not yet available and consequently, we can not publish the acknowledgments at this time. A full and complete list will be available from the Registrar's Office prior to the commencement of classes in September of 1964 and the same information will be printed in the calendar for the year 1965-66. The scholarships will be awarded to first and second year students, as the case may be, for proficiency in

the school year 1964-65 and will be tenable in the school year 1965-66. In general, these scholarships are awarded on the basis of the manipulative skills, academic ability, and qualities of leadership.

Alberta Hotel Association	\$2,000
Canadian Utilities Limited	250
California Standard Oil Company (scholarship to be awarded to a first-year student enrolled in Gas Technology, effective in second year, the award to be made to the top student in first year)	200
The Charles Margolus Scholarship	100
Sherritt Gordon Mines Limited (available every other year)	150
British American Oil Company Limited	50
Canadian Industries Limited	50
Dominion Glass Company Limited	50
McCoy Bros. Ltd.	50
McKinley & Taylor Ltd.	50
Metal Fabricators & Roofing Ltd.	50
Molson's Edmonton Brewery Ltd.	50
North Western Pulp & Power Ltd.	50
Western Chemicals Limited	50
Queen Elizabeth Education Scholarship Fund (to students with highest standing)	50
Industrial Laboratory Advisory Committee Book Award	Chemistry Handbook



## ARCHITECTURAL TECHNOLOGY

### TWO-YEAR COURSE

September 16, 1964, to May 19, 1965

Fee for each year \$54.00 plus Registration Fee of \$5.00

Many opportunities exist in the building and design industries for young men and women with a sound architectural training. This course is intended to give the student a practical training in architectural design, an understanding of the properties and functions of the many old and new materials of construction and the ability to solve many of the elementary problems of structural design. Much practical drawing is done and a high level of drafting skill is expected to be developed.

Opportunities for employment are available in architectural offices, drafting offices, construction companies and many others. The

graduate may embark on a program to complete his articles in architecture, write his professional examinations and so obtain certification as a registered architect. Other related jobs such as building inspector, estimator and building products salesman may be competently handled by the graduate.

Preference will be given to applicants who have a minimum of 100 Alberta high school credits, or equivalent, including at least a "B" standing in Math. 30 or 32, Science 20 and English 20. A transcript of high school marks, or other documentary proof, must accompany each application. (See back of application form.)

#### Instruments, Equipment and Supplies:

Cost of these for the first year is approximately \$100 depending upon the quality selected. Students should not purchase any of these items until they consult with their instructors. Cost of supplies for the second year will be about \$40.

# COURSE OUTLINE

## FIRST YEAR

### First Quarter

Math.	101	Analytical Geometry	5	0
Engl.	101	Introductory Technical English	3	0
Phys.	101	Heat, Sound, & Optics	4	2
Con.	104	Materials of Construction	2	3
CT.	101	Introduction to Engineering Works	0	1
AT.	101	Drawing and Sketching	1	2
DT.	101	Elementary Drafting	3	4

Lect. Lab.

18 + 12=30

### Fourth Quarter

Engl.	204
Con.	223
CT.	261
AT.	213
AT.	222
AT.	231

## SECOND YEAR

Lect. Lab.

0 3  
2 2  
2 2  
2 9  
2 4  
2 0  
TOTAL 10 + 20=30

### Second Quarter

Math.	102	Trigonometry	5	0
Engl.	102	Communication Skills	3	0
Phys.	102	Electricity and Magnetism	4	2
Con.	121	Materials and Methods I	2	2
AT.	111	Architectural Drafting I	1	8
CT.	111	Statics I	3	0

Con. CT. AT. AT. AT.

211 131 266 232 214 223  
18 + 12=30

### Fifth Quarter

Estimating I	2	3
Concrete	2	2
Reinforced Concrete Design	3	0
Sanitary Services	2	2
Architectural Drafting IV	2	9
Design III	0	3

TOTAL 11 + 19=30

### Third Quarter

Math.	103	Calculus I	3	0
Engl.	103	Data Presentation	3	0
Con.	122	Materials and Methods II	2	2
CT.	112	Statics II	2	3
AT.	112	Architectural Drafting II	2	9
AT.	121	Design I	1	3

AT. CT. CT. AT. AT. AT.

251 203 263 215 224 233  
13 + 17=30

### Sixth Quarter

Architectural Practice	2	0
Specifications and Contracts	1	2
Structural Design in Wood	2	2
Architectural Drafting V	2	9
Design IV	1	6
Electrical Services	3	0

TOTAL 11 + 19=30

# CIVIL TECHNOLOGY

## TWO-YEAR COURSE

September 16, 1964, to May 19, 1965

Fee for each year \$54.00 plus Registration Fee of \$5.00

The technician in the field of Civil Engineering is offered a variety of attractive employment opportunities. This field embraces the construction of highways, railroads, bridges, viaducts, dams, harbor facilities, irrigation and reclamation projects, water power developments, city planning and similar projects, many of them of great size involving enormous expenditures.

As a member of the engineering "team" he may be associated as a surveyor, draftsman, estimator, water or sewage treatment plant operator, town works foreman, construction foreman, superintendent or inspector, or as an engineering aide to the contractor or Civil Engineer. His work may involve either the planning or the supervision of construction work—frequently a combination of both.

The Civil Engineering Technician must acquire a considerable store of technical knowledge on a variety of subjects. He will require sound training in mathematics so that he may perform calculations required in surveying and so that he may determine the safe capacities of construction elements. He must learn to use surveying instruments—the transit and level. The technician should be skilled in drafting and detailing. He must learn the use and properties of all construction materials—timber, masonry, concrete, structural steel, etc. His training will include instruction in such subjects as engineering mechanics, statics, strength of materials, highway engineering and hydraulics. Finally, he needs a fundamental knowledge of office practices such as business correspondence, engineering economics, cost estimating and specification writing.

Preference will be given to applicants who have a minimum of 100 Alberta high school credits, or equivalent, including at least a "B" standing in Math. 30 or 32, Science 20 and English 20. A transcript of high school marks, or other documentary proof must accompany each application. Books and supplies will be about \$100.00.

## COURSE OUTLINE

### FIRST YEAR

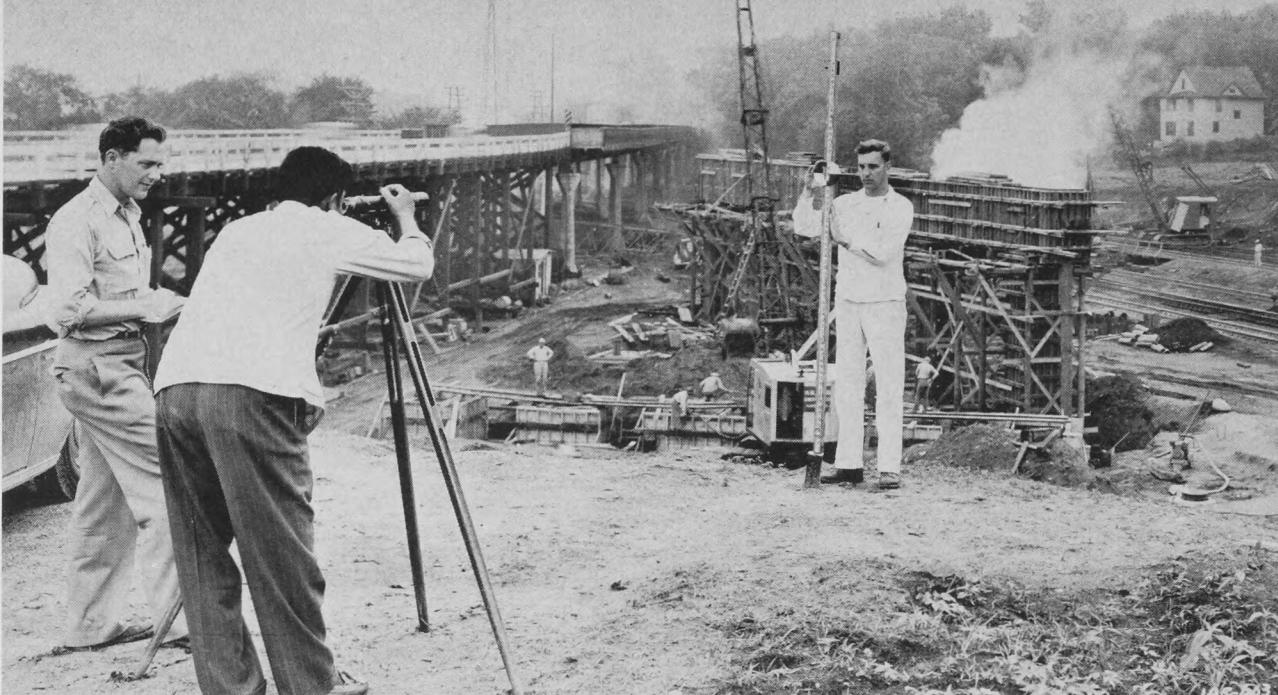
First Quarter			Lect.	Lab.
Math.	101	Analytical Geometry	5	0
Engl.	101	Introductory Technical English	3	0
Phys.	101	Heat, Sound and Optics	4	2
Con.	101	Materials of Construction I	3	0
DT.	102	Elementary Drafting	2	4
IL.	101	Inorganic Chemistry	3	3
CT.	101	Introduction to Engineering Works	0	1
		TOTAL	20	+ 10=30

### Second Quarter

Math.	102	Trigonometry	5	0
Engl.	102	Communication Skills	3	0
Phys.	102	Electricity and Magnetism	4	2
Con.	102	Materials of Construction II	0	2
DT.	161	Drawing and Sketching	1	2
DT.	154	Detailing	1	3
CT.	111	Statics I	3	0
CT.	121	Surveying	4	0
		TOTAL	21	+ 9=30

### Third Quarter

Math.	103	Calculus I	3	0
Engl.	103	Data Presentation	3	0
DT.	155	Design Drafting	1	3
CT.	112	Statics II	2	3
CT.	122	Survey Field Work	0	3
CT.	131	Concrete	2	2
CT.	141	Strength of Materials I	3	0
CT.	151	Soil Mechanics I	2	3
		TOTAL	16	+ 14=30



#### SECOND YEAR

##### Fourth Quarter

Math.	204	Calculus II	3	0		CT.	264	Reinforced Concrete Design I	3	3	
Engl.	204	Report Project	0	3		CT.	272	Hydraulics II	1	3	
Con.	203	Construction Methods	2	0		CT.	281	Highway Design and Construction I	2	2	
MT.	203	Engineering Materials	2	0		CT.	291	Sanitary Engineering I	2	2	
CT.	213	Dynamics	2	0				TOTAL	11	+	19=30
CT.	242	Strength of Materials II	1	2		IndRel.	201	Industrial Relations	2	0	
CT.	243	Structural Analysis I	2	0		MT.	224	Non-Destructive Testing	1	3	
CT.	252	Soil Mechanics II	0	3		CT.	202	Seminar	0	1	
CT.	261	Structural Design in Steel I	2	2		CT.	203	Specifications and Contracts	1	2	
CT.	263	Structural Design in Wood	2	2		CT.	244	Structural Analysis II	1	2	
CT.	271	Hydraulics I	2	0		CT.	253	Foundations	1	3	
			TOTAL	18	+	12=30	CT.	254	Asphalt and Soil Cement	0	3
						CT.	265	Reinforced Concrete Design II	2	3	
						CT.	282	Highway Design and Construction II	0	3	

##### Sixth Quarter

##### Fifth Quarter

Con.	211	Estimating I	2	3		CT.	282	Highway Design and Construction II	0	3	
MT.	213	Destructive Testing	0	3		CT.	292	Sanitary Engineering II	0	2	
CT.	262	Structural Design in Steel II	1	3				TOTAL	8	+	22=30



## DENTAL ASSISTANT PROGRAM

### TEN-MONTH COURSE

September 8, 1964 to June 19, 1965

Fees \$54.00 plus Registration Fee \$5.00

The Dental Assistant works with the Dentist, assisting him in his operations and in other duties connected with the office, such as keeping of records and office management. A variety of interesting employment opportunities exist in the general practice, the specialist's office, health clinics and hospitals, and the dental corps of the Armed Forces.

The course offered by the Institute will be split into three periods consisting of I - 6 months at the Institute on basic principles and training. II - 2 months at the University of Alberta Dental Clinic. III - 1½ months at the Institute on practice management. The curriculum is organized to provide basic technical knowledge, the manual skills and the clinical experience essential for competence and success in Dental Assisting.

Applicants must realize that in addition to technical proficiency, the ability to meet and deal with the public, poise, and an outgoing personality are helpful assets in the art of successful Dental Assisting.

Preference will be given to applicants who have a minimum qualification of Grade XI, including at least "B" standing in Math 20 or 21, Science 20 or 22 and English 20. A transcript of High School marks or other documentary proof must accompany each application form.

### I NAIT 8 September, 1964 to 26 February, 1965

#### Preclinical Training

			Lect.	Lab.
DA.	101	Orientation	3	0
DA.	111	Basic Sciences	8	5
DA.	121	Basic Techniques	7	7
	TOTAL		18	+ 12=30

### II University of Alberta, March 1, 1965 to April 30, 1965

#### Clinical Orientation

Clinical Laboratory (Practice of Techniques) 30

### III NAIT 2 May, 1965 to 19 June, 1965—Clinical Practice and Orientation

			Lect.	Lab.
DA.	202	Applied Psychology	1	1
DA.	203	Practice Management	3	0
DA.	222	Public Health	6	8
DA.	223	Chairside Assisting	4	7
	TOTAL		14	+ 16=30

#### Textbooks, Instruments, Etc.

The cost of books, instruments, etc., should not exceed a total of \$35.00 for Periods I and II, and a further \$25.00 for Period III. Students are advised not to purchase any of these supplies until they have met their instructors.

**N.B.** The above course outline details are tentative and minor adjustments may be made.

# DENTAL MECHANIC PROGRAM

## TWO-YEAR COURSE

September 16, 1964 to May 19, 1965

Fees \$54.00 plus Registration Fee of \$5.00

The object of this course is to provide a theoretical and practical program for the student who wishes to qualify as a Dental Mechanic in the construction of full dentures only.

A sound basic knowledge of the Science subjects is of prime importance. A combination of this knowledge with the Institutional and external training will enable the successful student to qualify for certification as a Dental Mechanic (For details see Certified Dental Mechanics Act.)

Applicants for this course should have a minimum of a High School Diploma and preference will be given to those who have at least a B standing in Math. 30 or 32, Science 20 and English 20. A transcript of High School marks or other documentary proof must accompany each application form.

ALL APPLICATIONS BY PROSPECTIVE STUDENTS MUST FIRST BE MADE TO THE BOARD OF CERTIFIED DENTAL MECHANICS, DEPARTMENT OF LABOR, GOVERNMENT OF ALBERTA.

### I NAIT—16 September, 1964 to 19 May, 1965

		Lect.	Lab.
DM.	101	Orientation	2
DM.	102	Elementary Clinical Principles	4
DM.	103	Denture Prosthesis I (Impressions, Denture Construction, etc.)	5
DM.	104	Dental Materials (Handling, indication for use, waxes, artificial teeth, metals, etc.)	4
DM.	105	Anatomy	5
		TOTAL	19 + 11=30



### II External

External laboratory practise of NAIT theory and practical training obtained in I.

### III NAIT—September, 1965 to May, 1966

DM.	201	Oral Health (review of biological aspects, lesions, acrylic allergies, pathological conditions, responsibilities of Dental Mechanic, etc.)	6	5
DM.	202	Practise Management, (General Psychology, personal conduct, business and practise management, etc.)	6	2
DM.	203	Denture Prosthesis II (Review of theories, repairs, single dentures, seminars—preparation of Scientific papers by Students)	6	5
		TOTAL	18	+ 12=30

### Textbooks, Instruments, etc.

The cost of books, instruments and supplies, etc., should not exceed a total of \$50.00 per year. Students are advised not to purchase any of these supplies until they have met their Instructors.

**N.B.** The above course outlines are tentative and minor adjustments may be made.



## DENTAL TECHNICIAN PROGRAM

### TWO-YEAR COURSE

September 16, 1964, to May 19, 1965

September 1965, to May 1966

Fees for each year \$54.00 plus Registration Fee of \$5.00

The intervening period will preferably be spent in external dental laboratories under the supervision of approved Dental Laboratory Technicians.

A Dental Laboratory Technician is a person educated and trained to be competent in all aspects of the dental laboratory procedures required in the creation of dental appliances under the licensed Dentist's or Physician's prescription or authorization. Unlike the Dental Mechanic, a qualified technician is competent to construct full or partial dentures, crown and bridge work and ceramics. This involves technical skill of a high order and also a sound knowledge of the science subjects. Accordingly, applicants should have a minimum of a

High School Diploma and preference will be given to those who have at least a B standing in Math. 30 or 32, Science 20 and English 20. Consideration will be given to those with comparable education. A transcript of High School marks or other documentary proof must accompany each application form.

Please note that prospective students must make their own arrangements for external laboratory practise. (Refer to Dental Technicians Act for registration procedures and regulations.)

#### I NAIT September 18, 1964, to May 15, 1965

			Lect.	Lab.
DN.	101	Orientation	1	0
DN.	111	Basic Sciences	2	1
DN.	112	Dental Anatomy	1	0
DN.	121	Dental Materials	4	4
DN.	122	Ceramics I	2	2
DN.	131	Denture Construction I	4	3
DN.	141	Crown and Bridge I	3	3
		TOTAL	17	+ 13=30

#### II EXTERNAL

External laboratory practise of NAIT theory and practical training obtained in I.

#### III NAIT September, 1965, to May, 1966

			Lect.	Lab.
DN.	202	Equipment Installation and Repair	2	0
DN.	203	Practise Management	2	0
DN.	223	Ceramics II	4	4
DN.	232	Denture Construction II	5	5
DN.	242	Crown & Bridge II	4	4
		TOTAL	17	+ 13=30

#### Textbooks, Instruments, Etc.

The cost of books, instruments and supplies, etc., should not exceed a total of \$50.00 per year. Students are advised not to purchase any of these supplies until they have met their Instructors.

N.B. The above course outlines are tentative and minor adjustments may be made.



### **TWO-YEAR COURSE**

September 16, 1964, to May 19, 1965

Fees for each year \$54.00 plus Registration Fee of \$5.00

This course is designed to train young men and women for positions as draftsmen in Western Canadian industry. The aim is to produce draftsmen with a high degree of skill and with a basic understanding of mechanical, structural and topographical drawing and design.

Practical aspects of the various fields of design will be learned through work done in the machine shop, the construction workshop and by surveying in the field. Field trips to machine shops, construction projects and other industrial points of interest will be made.

## **DRAFTING TECHNOLOGY**

The nature of Alberta industry, which is highly varied, but which provides only a small number of manufacturing concerns, has created a demand for a highly skilled draftsman of knowledge and experience sufficiently wide to be able to handle problems in several different fields of design. This demand the course attempts to meet.

Related courses are offered in Mathematics, Science and English. These subjects provide the tools for the solution of many of the practical problems to be encountered in the fields of design. Further they provide the individual with an educational background much beyond that of the tradesman and consequently help to fit him for positions of responsibility.

Preference will be given to applicants who have a minimum of 100 Alberta high school credits, or equivalent, including at least a

"B" standing in Math. 30 or 32, Science 20 and English 20. A transcript of high school marks, or other documentary proof must accompany each application. (See back of application form.)

**Textbooks and Instruments:**

First-year students are required to purchase these to a value of approximately \$100.00. Second-year students require additional equipment to a value of about \$40.00.

## COURSE OUTLINE

Typical courses included in this program are:

### FIRST YEAR

#### First Quarter

			Lect.	Lab.	
Math.	101	Analytical Geometry	5	0	
Engl.	101	Introductory Technical English	3	0	
Phys.	101	Heat, Sound, Optics	4	2	
Con.	104	Materials of Construction	3	2	
CT.	101	Introduction to Engineering Works	0	1	
IP.	101	Machine Shop I	1	2	
DT.	101	Elementary Drafting	3	4	
		TOTAL	19	+ 11=30	

#### Second Quarter

			Lect.	Lab.	
Math.	102	Trigonometry	5	0	
Engl.	102	Communication Skills	3	0	
Phys.	102	Electricity and Magnetism	4	2	
CT.	121	Surveying	3	0	
DT.	121	Drafting, Techniques I	2	8	
IP.	102	Machine Shop II	1	2	
		TOTAL	18	+ 12=30	

#### Third Quarter

			Lect.	Lab.	
Math.	103	Calculus I	3	0	
Engl.	103	Data Presentation	3	0	

CT.	111	Statics I	3	0
Con.	105	Construction Techniques	0	3
CT.	122	Survey Field Work	0	3
DT.	122	Drafting Techniques I	2	8
DT.	131	Geological and Topographical Drafting	1	4
		TOTAL	12	+ 18=30

### SECOND YEAR

#### Fourth Quarter

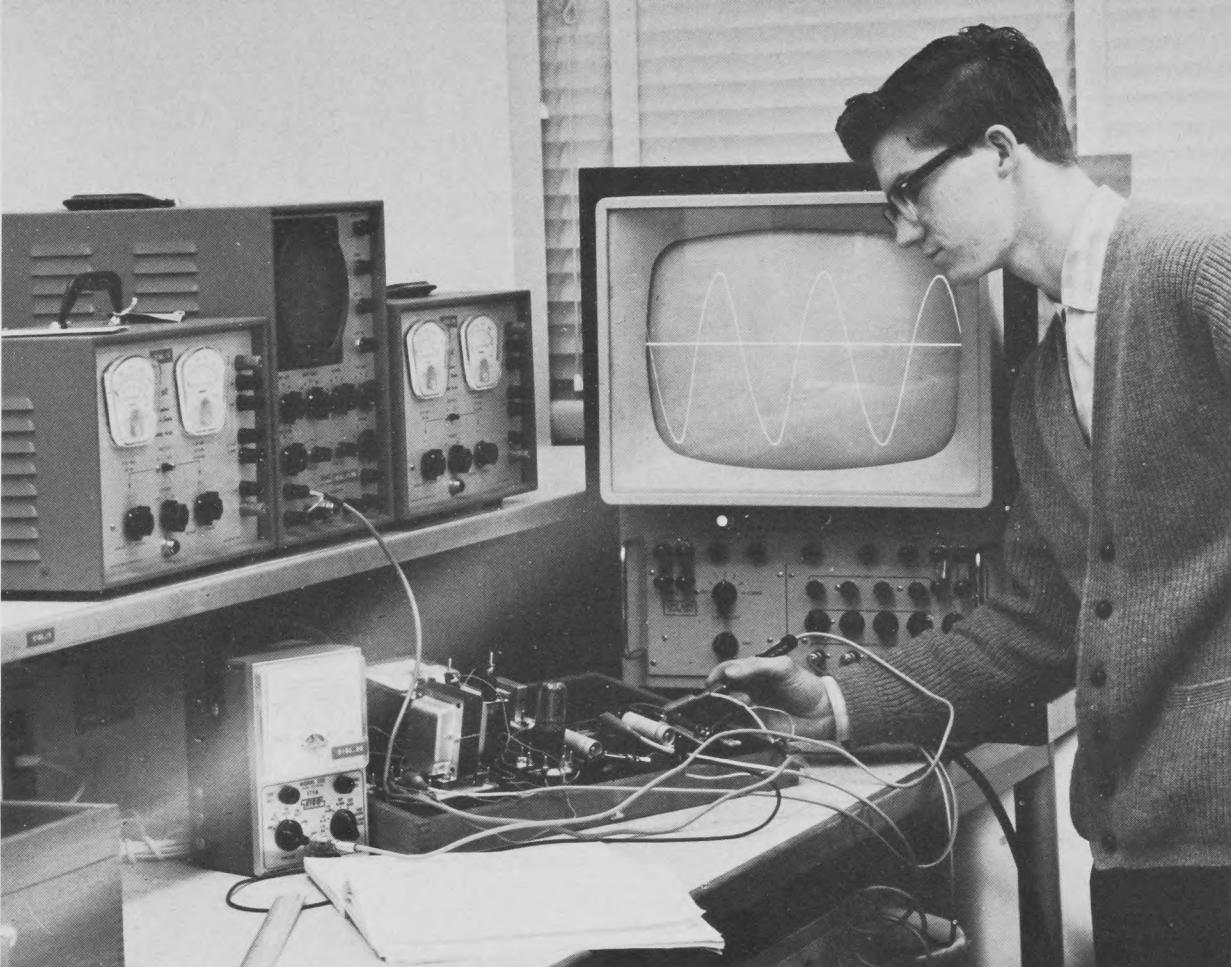
Math.	204	Calculus II	3	0
Engl.	204	Report Project	0	3
AT.	202	Architectural Drafting I	1	3
CT.	112	Statics II	2	3
IP.	203	Machine Shop III	1	2
DT.	241	Mechanical Drafting I	2	4
DT.	251	Structural Drafting I	2	4
		TOTAL	11	+ 19=30

#### Fifth Quarter

Con.	211	Estimating I	2	3
AT.	203	Architectural Drafting II	1	3
IP.	204	Machine Shop IV	1	4
PT.	203	Photo Drafting	1	3
DT.	242	Mechanical Drafting II	2	4
DT.	252	Structural Drafting II	2	4
		TOTAL	9	+ 21=30

#### Sixth Quarter

IndRel.	201	Industrial Relations	2	0
AT.	204	Architectural Drafting III	1	3
CT.	203	Specifications and Contracts	1	2
CT.	267	Structural Design	3	4
DT.	232	Survey and Topographical Drafting	2	6
DT.	243	Mechanical Drafting III	2	4
		TOTAL	11	+ 19=30



## ELECTRONIC TECHNOLOGY

### TWO-YEAR COURSE

September 16, 1964, to May 19, 1965

Fees for each year \$54.00 plus Registration Fee of \$5.00

This course is designed to provide engineering technicians of high calibre to work in design, research, production, maintenance, or installation phases of the radio and electronic industry. Graduates of the course have been employed in research and engineering departments of government and industry, with utility companies, in radio

and television broadcasting, in the oil industry and in radio and television maintenance.

The Institute is well supplied with laboratory space and modern equipment. Electronic equipment ranges from simple meters to complete transmitting, industrial electronic and radar installations. The course is an intense one and consistent hard work is necessary for successful graduation.

Preference will be given to applicants who have a minimum of 100 Alberta High School credits, or equivalent, including at least a

"B" standing in Math 30 or 32, Science 20 and English 20. A transcript of high school marks, or other documentary proof must accompany each application. (See back of application form.)

**Tools:**

Arrangements have been made with local suppliers to provide tool kits at a nominal price. Students are advised not to purchase tools until they have met their lab. instructors who will advise as to requirements. Books and supplies are available at the Institute Book Store at a cost of approximately \$80.00 for the first year.

## COURSE OUTLINE

### FIRST YEAR

#### First Quarter

			Lect.	Lab.	
Math.	121	Analytical Geometry and Basic Trigonometry	3	0	
Engl.	101	Introductory Technical English	3	0	
Phys.	111	Mechanics	4	0	
ET.	111	Basic Electricity and Electronics	8	0	
ET.	112	DC and AC Fundamentals Lab.	0	12	
		TOTAL	18	+ 12=30	

#### Second Quarter

			Lect.	Lab.	
Math.	122	Practical Analysis	3	0	
Engl.	102	Communication Skills	3	0	
ET.	113	Basic Electronics Lab.	0	12	
ET.	121	Radio Communications I	8	0	
ET.	131	Instruments I	4	0	
		TOTAL	18	+ 12=30	

#### Third Quarter

			Lect.	Lab.	
Math.	123	Calculus	6	0	
ET.	122	Radio Communications II	8	0	
ET.	123	HF Communications Lab. I	0	12	
ET.	141	Sound Systems	4	0	
		TOTAL	18	+ 12=30	

### SECOND YEAR

#### Fourth Quarter

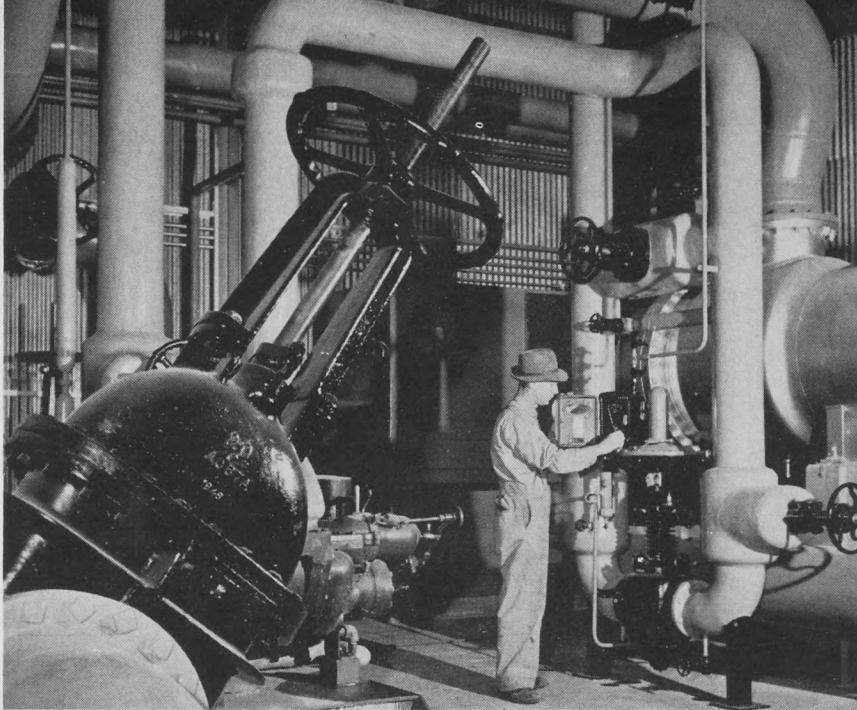
			Lect.	Lab.
Math.	225	Applied Math I	3	0
Phys.	214	Optics and Modern Physics	5	0
DT.	205	Elementary Drafting	1	3
ET.	232	Instruments II	3	0
ET.	233	Instruments Lab.	0	6
ET.	251	Television Theory	6	0
ET.	254	Pulse Theory	3	0
		TOTAL	21	+ 9=30

#### Fifth Quarter

			Lect.	Lab.
Math.	226	Applied Math II	3	0
Engl.	102	Data Presentation	3	0
DT.	271	Electronics Drafting	0	3
ET.	224	HF Communications Lab. II	0	3
ET.	252	Television Lab. I	0	6
ET.	261	Microwave and Radar Theory	5	0
ET.	255	Transistor Theory	3	0
ET.	271	Industrial Electronics	4	0
		TOTAL	18	+ 12=30

#### Sixth Quarter

			Lect.	Lab.
Engl.	204	Report Project	0	3
IndRel.	201	Industrial Relations	2	0
ET.	225	VHF and UHF Telecommunications	3	4
ET.	253	Television Lab. II	0	3
ET.	262	Microwave and Radar Lab.	0	6
ET.	272	Industrial Electronics Lab.	0	9
		TOTAL	5	+ 25=30



## GAS TECHNOLOGY

### TWO-YEAR COURSE

September 16, 1964, to May 19, 1965

Fees for each year \$54.00 plus Registration Fee of \$5.00

The gas industry in Alberta and Western Canada is now enjoying a tremendous expansion phase. The recent granting of licenses for gas export to the United States has resulted in many hundreds of wells being opened up, gas plants being built and thousands of miles of new pipeline construction.

To the Gas Technician, this means many new opportunities in gas production and plant operation, laboratory analysis and gas transmission work.

Automatic control and recording equipment is one of the most rapidly-increasing areas of development in the industry, and one of the most fascinating to those interested in mechanical, pneumatic, hydraulic and electronic apparatus.

The Gas Technology program will acquaint students with all phases of the natural gas industry, beginning with the geological occurrence of natural gas, continuing on to the exploration, drilling and production aspects of the industry and finishing up with studies of the intricacies of gas processing and transportation.

As in all the Technologies, Mathematics, Physics, Chemistry and English instruction form an integral part of the program. Technicians who aspire to management or other positions of increased responsibility will find a good command of the written and spoken word invaluable.

Preference will be given to applicants who have a minimum of 100 Alberta high school credits, or equivalent, including at least a "B" standing in Math 30 or 32, Science 20 and English 20. A transcript of high school marks, or other documentary proof must accompany each application. (See back of application course outline form.)

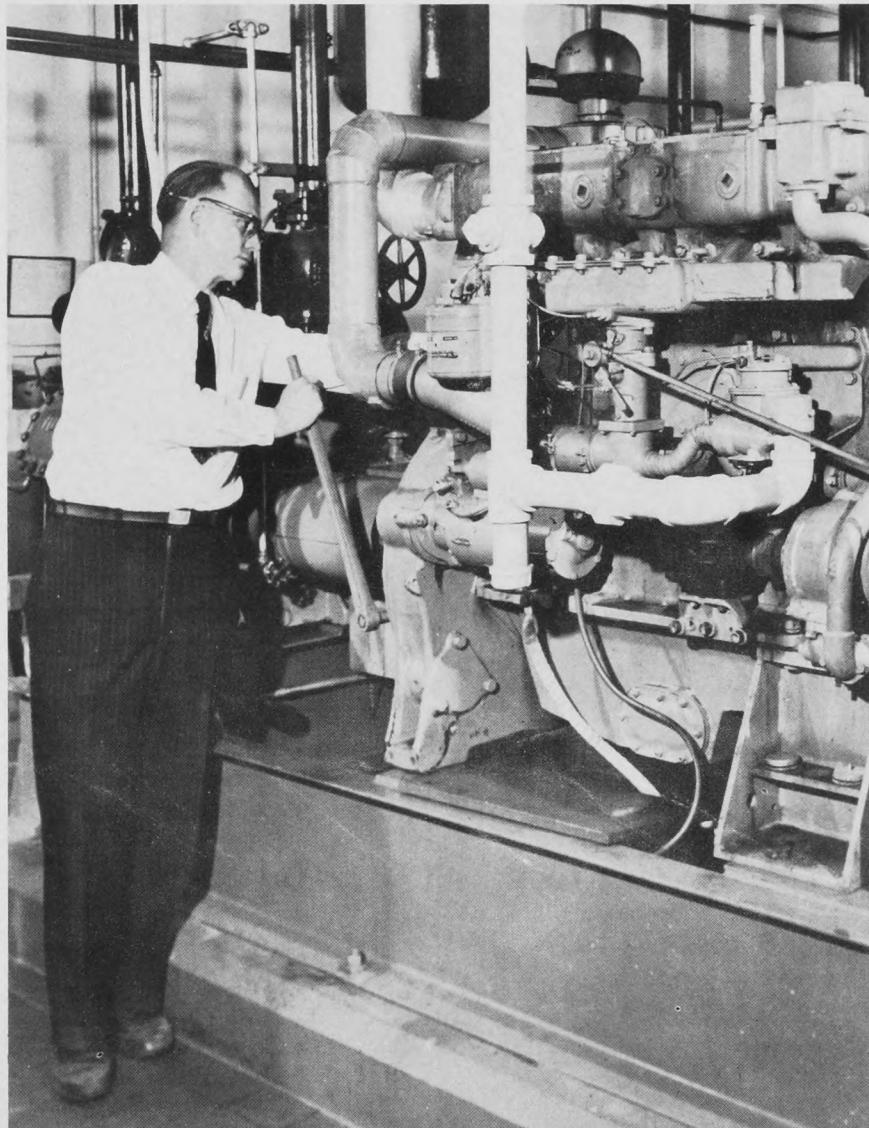
### COURSE OUTLINE

#### FIRST YEAR

First Quarter	Lect.	Lab.
GT. 101	Introduction Gas Technology	4 0
Math. 101	Analytical Geometry	5 0
Engl. 101	Introductory Technical English	3 0
Phys. 101	Heat, Sound and Optics	4 2
DT. 102	Elementary Drafting	0 6
IL. 101	Inorganic Chemistry	3 3
TOTAL	19	+ 11=30

<b>Second Quarter</b>						IT.	204	Instrumentation	2	2
Math.	102	Trigonometry	5	0		MT.	204	Properties of Materials	3	3
Engl.	102	Communication Skills	3	0		GT.	121	Hydrocarbon Phase Behavior	2	0
Phys.	102	Electricity and Magnetism	4	2					TOTAL	19 + 11=30
DT.	144	Mechanical Drafting	1	3						
IL.	102	Physical and Analytical Chemistry	3	3						
GT.	111	Valuation of Reserves	3	3						
			TOTAL	19	+ 11=30					
<b>Third Quarter</b>										
Math.	103	Calculus I	3	0		Engl.	103	Data Presentation	3	0
Phys.	103	Modern Physics	4	2		ET.	201	Basic Electronics	3	3
CT.	113	Statics and Dynamics	5	0		IL.	205	Stoichiometry	3	3
IL.	103	Organic Chemistry	3	3		IT.	205	Gas Instrumentation	2	2
GT.	131	Field Handling	3	3		GT.	242	Gas Plant Operations	2	3
CT.	123	Surveying	1	3		GT.	241	Gas Processing	3	0
			TOTAL	19	+ 11=30				TOTAL	16 + 14=30
<b>SECOND YEAR</b>										
<b>Fourth Quarter</b>						Lect.	Lab.			
Math.	204	Calculus II	3	0		GT.	271	Thermodynamics I	3	3
GT.	202	Codes and Regulations	3	0		IL.	206	Industrial Stoichiometry	3	0
GT.	232	Field Handling II	3	3		GT.	203	Seminar	0	3
IL.	204	Industrial Organic Chemistry	3	3		GT.	251	Gas Transmission	4	0
						GT.	261	Gas Analysis	0	3
						GT.	271	Equipment and Pipe Line Design	3	3
						Con.	101	Materials of Construction I	3	0
						Eng.	204	Report Project	0	3
						IndRel.	201	Industrial Relations	2	0
									TOTAL	18 + 12=30

# HEAVY DUTY EQUIPMENT TECHNOLOGY



## TWO-YEAR COURSE

September 16, 1964 to May 19, 1965

Fees first year \$74.00, Second year \$59.00

During each fiscal year millions of dollars are spent on heavy duty equipment in Alberta. The maintenance, repair and servicing of these units, together with the servicing of highway vehicles used for heavy transport throughout the western provinces, creates tremendous opportunities for well-trained technicians.

Prospective employees in the Heavy Duty Diesel field will find competition keen, but for skilled craftsmen who fully understand equipment in current use, the future appears to be most promising.

Skill in the use of tools and ideas is essential, and the successful technician must possess mechanical aptitude. In addition to this, it is essential that he have a working knowledge of mathematics, physics, mechanics, drafting, strength of materials and thermodynamics. His training should also include courses in report writing and business letter writing, and he should have a knowledge of the fundamentals of business organization and management.

This course provides for the sound and broad basic training necessary to prepare young men to later enter any of the specialized fields and to gain "Journeyman Status" as an attainment of definite standards of practical skill and theoretical knowledge. The training provides the potential for a graduate to qualify later on for such specific positions in industry as: Maintenance Mechanic; Maintenance Foreman; Service Supervisor; Equipment Controller and Dispatcher; Sales Technician; Service Training Technician; Industrial Plant Educator.

For success in any of these higher positions, it is necessary for a graduate to first prove himself as a skilled tradesman. The course provides excellent preparation for the examinations of competency which all Heavy Duty Mechanics must pass in order to become

designated under the Tradesmen's Qualifications Act of the Province or to obtain Dominion Journeyman's Certification. Successful completion of the course carries with it official recognition by the Provincial Apprenticeship Board.

Preference will be given to applicants having a minimum of 67 Alberta high school credits, or equivalent. A transcript of high school marks or other documentary proof must accompany each application.

Admission to the second year of this program is restricted to those with the above qualifications who have successfully completed the first year course; taken the eight-month Diesel Mechanics Course at the Southern Alberta Institute of Technology; or hold a valid certificate of proficiency in either the Heavy Duty Trade or the Motor Vehicle Repair Trade.

## COURSE OUTLINE

### FIRST YEAR

		Lect.	Lab.			
First Quarter						
HDT.	100	Hand and Power Tool Operating	0	7		
HDW.	100	Oxy-acetylene Welding	0	8		
HD.	101	Heavy Equipment Shop	0	6		
HD.	102	Heavy Equipment Theory	4	0		
Math.	151	Mathematics (Algebra, Geometry and Trig.)	5	0		
		TOTAL	9	+ 21=30		

		Lect.	Lab.			
Second Quarter						
HD.	103	Heavy Equipment Shop	0	15		
HD.	104	Heavy Equipment Theory	10	0		
Engl.	152	General Knowledge and Technical English	5	0		
		TOTAL	15	+ 15=30		

### Third Quarter

HD.	105	Heavy Equipment Shop	0	15
HD.	106	Heavy Equipment Theory	10	0
Phys.	181	Physics	5	0
		TOTAL	15	+ 15=30

### Fourth Quarter

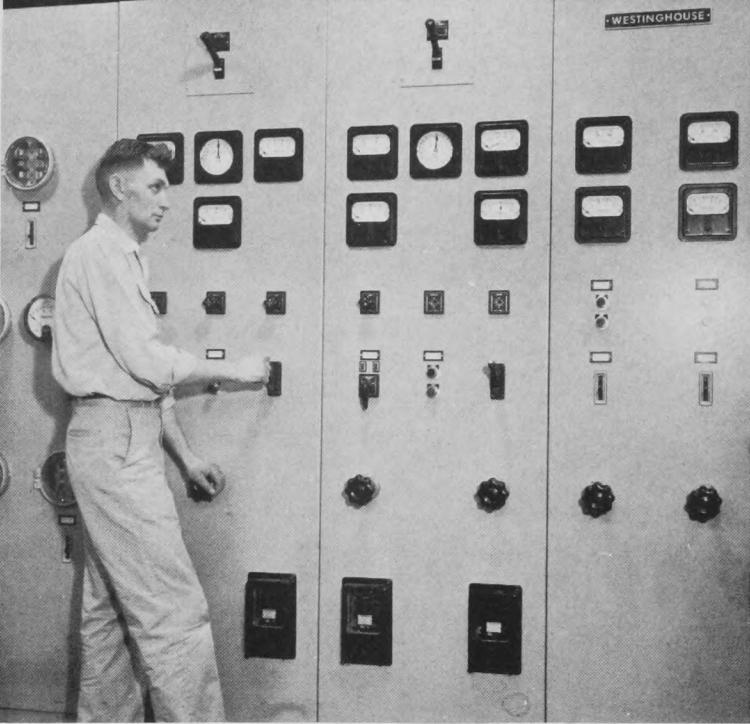
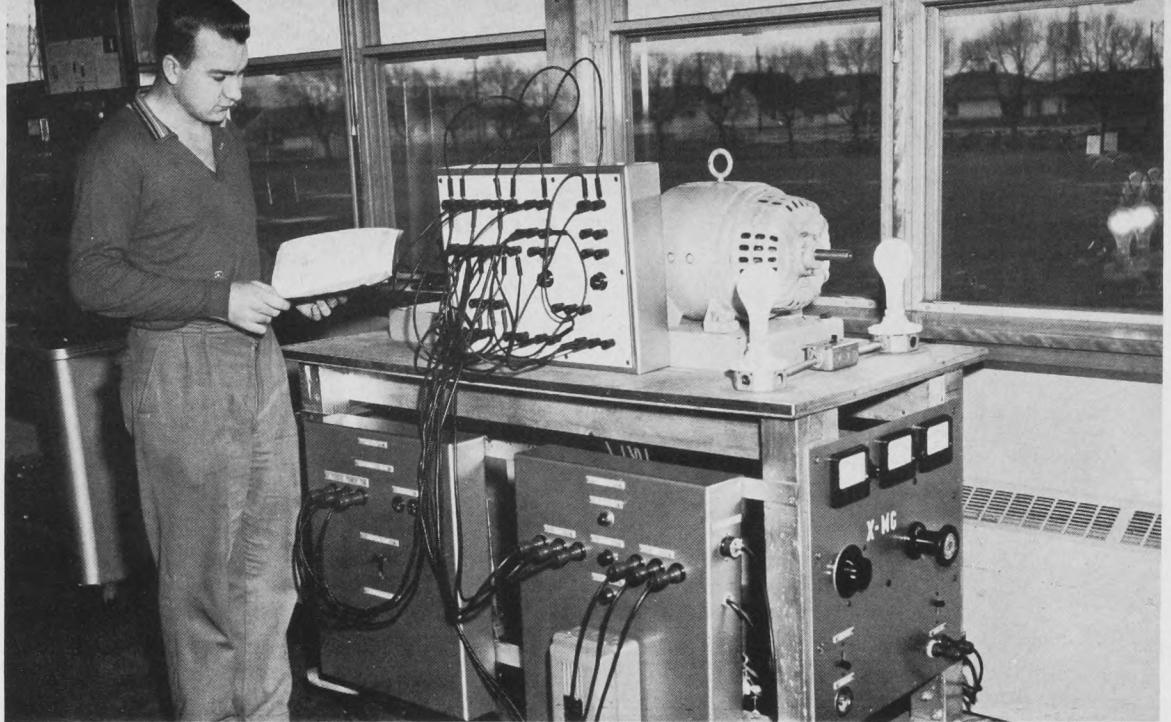
IP.	201	Machine Shop I	1	2
IE.	203	Electricity I	2	3
HD.	200	Elements of Heat Engines	0	6
HD.	201	Advanced Heavy Equipment Shop	0	6
Engl.	252	Communication Skills	3	0
DT.	206	Sketching and Blueprint Reading	4	0
Phys.	282	Mechanics	3	0
		TOTAL	13	+ 17=30

### Fifth Quarter

IP.	202	Machine Shop II	1	2
IE.	204	Electricity II	2	3
HD.	202	Thermodynamics	0	5
CT.	271	Hydraulics	2	0
IL.	244	Fuels and Lubricants	3	3
Engl.	204	Report Project	0	3
IP.	232	Mechanisms	2	1
IndRel.	201	Industrial Relations	3	0
		TOTAL	13	+ 17=30

### Sixth Quarter

CT.	272	Hydraulics	1	3
MT.	204	Properties of Materials	0	8
HD.	203	Advanced Heavy Equipment Shop	0	6
B.(HD.)	200	Bookkeeping	5	0
B.(HD.)	230	Business Administration and Personnel Management	2	0
B.(HD.)	240	Retail Merchandising and Collections	5	0
		TOTAL	13	+ 17=30



## ELECTRICAL TECHNOLOGY

### TWO-YEAR COURSE

September 16, 1964, to May 19, 1965

Fees for each year \$54.00 plus Registration Fee of \$5.00

Industrial Electrical Technology is concerned with the use of electricity as an abundant, flexible, inexpensive form of energy made available and controlled to serve the needs of industry.

This use requires a broad knowledge of basic electrical theory, circuitry, electrical machines, and a rapidly increasing knowledge of industrial electronics and specialized controls.

Graduates of the Industrial Electrical Technology course may find employment with electrical manufacturers, in production control, design, testing laboratories, market planning, estimating, installation and technical sales.

Electrical power generation, distribution and metering, industrial electronics and controls, telemetering, telecommunications, X-ray, elevators, business machines and many others are phases of industrial electricity in which graduates are employed.

The demand for these trained engineering technicians exceeds the supply, and, with Alberta's expanding industrialization, the future of electrical technology appears bright. Graduates of the course who may be interested in obtaining their Journeyman's license as electrical wiremen are referred to the section of the Announcement dealing with credits for technology program work.

Preference will be given to applicants who have a minimum of 100 Alberta high school credits, or equivalent, including at least a "B" standing in Math 30 or 32, Science 20 and English 20. A transcript of high school marks, or other documentary proof must accompany each application. (See back of application form.)

# COURSE OUTLINE

## FIRST YEAR

### First Quarter

Math.	121	Analytical Geometry and Basic Trigonometry	3	0
Engl.	101	Introductory Technical English	3	0
Phys.	131	Electricity and Magnetism	3	0
DT.	103	Elementary Drafting	2	3
IE.	111	Codes and Safety I	1	0
IE.	121	DC Circuits and Meters	5	0
IE.	122	DC Circuits and Meters Lab.	0	10

Lect. Lab.

TOTAL 17 + 13=30

### Fourth Quarter

Math.	224	Trigonometry	3	0
Engl.	204	Report Project	0	3
Phys.	234	Sound and Modern Physics	3	0
IE.	214	Codes and Safety IV	1	0
IE.	225	DC and AC Circuits II	4	0
IE.	226	DC and AC Circuits Lab. II	0	8
	252	Electronics II	4	4
		TOTAL	15	+ 15=30

### Fifth Quarter

Math.	225	Calculus I	3	0
Phys.	235	Electro-chemistry and Light	3	0
IndRel.	201	Industrial Relations	2	0
IE.	215	Codes and Safety V	1	0
IE.	243	Electrical Machines II	5	0
IE.	244	Electrical Machines Lab. II	0	10
IE.	261	Instruments and Measurements I	2	4
		TOTAL	16	+ 14=30

### Sixth Quarter

Math.	226	Calculus II	3	0
Phys.	236	Optics	3	0
IE.	216	Codes and Safety VI	1	0
IE.	262	Instruments and Measurements II	2	4
IE.	271	Industrial Controls	4	0
IE.	272	Industrial Controls Lab.	0	8
IE.	281	Circuit Design	3	2
		TOTAL	16	+ 14=30

### Tools, Textbooks, Drafting Instruments, etc.:

The cost of tools, books and other supplies should not exceed \$100.00 for the first year and \$40.00 for the second year. Students are advised not to purchase any of these supplies until they have met their instructors.



## CHEMICAL LABORATORY TECHNOLOGY

### TWO-YEAR COURSE

September 16, 1964, to May 9, 1965

Fees for each year \$54.00 plus Registration Fee of \$5.00

Tremendous strides have been made in developing the petroleum and natural gas reserves of this Province. As a direct result of this industrial expansion, a petrochemicals industry of sizeable proportions is making its appearance. Several large chemical plants are now in process of construction or are already in production. It is natural, therefore, that a keen demand has arisen for industrial laboratory technicians of high calibre to assist in process control of a variety of chemical products.

Many openings are available at attractive rates of pay. There appear to be excellent prospects for employment in this field with the various petrochemical industries and refineries. In the past, students have also received employment as laboratory technicians with the Department of National Defence, University of Alberta and the various Research Councils.

Students registered in this course will be eligible for student membership in the Chemical Institute of Canada, and may write the

examinations of the Chemical Institute to qualify for full professional membership.

Preference will be given to applicants who have a minimum of 100 Alberta high school credits, or equivalent, including at least a "B" standing in Math 30 or 32, Science 20 and English 20. A transcript of high school marks, or other documentary proof must accompany each application. (See back of application form.)

### COURSE OUTLINE

#### FIRST YEAR

First Quarter		Lect.	Lab.
Math	101	Analytical Geometry	5 0
Engl	101	Introductory Technical English	3 0
Phys	151	Liquids, Gases and Heat	3 0
DT	104	Basic Sketching and Drafting	1 1
MT	102	Material Sampling and Testing	1 1
IL	131	Inorganic Qualitative Analysis	3 9
IL	141	Oil Chemistry I	1 2
		TOTAL	17 + 13 = 30

Second Quarter									
Math	102	Trigonometry		5	0	IL	255	Industrial Organic Chemistry	2
Engl	102	Communication Skills		3	0	IL	263	Instrumental Analysis III	2
Phys	152	Mechanics		2	2	IL	272	Stoichiometry II	2
IL	132	Inorganic Quantitative Analysis		3	9	IL	276	Chemical Statistics II	1
IL	151	Basic Organic Chemistry I		3	0				0
IL	142	Oil Chemistry II		1	2			TOTAL	13 + 17=30
			TOTAL	17	+				

Third Quarter									
Math	103	Calculus		3	0	IL	255	Industrial Organic Chemistry	2
Engl	103	Data Presentation		3	0	IL	263	Instrumental Analysis III	2
Phys	(254)+153	Electrostatics and DC Electricity		4	0	IL	272	Stoichiometry II	2
IL	133	Industrial Inorganic Chemistry		3	8	IL	276	Chemical Statistics II	1
IL	152	Basic Organic Chemistry II		3	3				0
IL	143	Oil Chemistry III		1	2				
			TOTAL	17	+				

### SECOND YEAR

Fourth Quarter										
ET	202	Electronics I		4	4	Lect.		Lab.		
IL	253	Aromatic Organic Chemistry		2	9	ET	202	Electronics I	2	
IL	261	Instrumental Analysis I		2	9	IL	253	Aromatic Organic Chemistry	1	
			TOTAL	8	+	22=30	IL	261	Instrumental Analysis I	2
							IL	281	Physical Chemistry I	1
							Math	204	Calculus II	3

Fifth Quarter										
Engl	204	Report Project		0	3	Lect.		Lab.		
ET	203	Electronics II		0	2	Engl	204	Report Project	0	
IL	254	Advanced Organic Chemistry		2	9	ET	203	Electronics II	0	
IL	262	Instrumental Analysis II		2	9	IL	254	Advanced Organic Chemistry	1	
IL	271	Stoichiometry I		2	0	IL	262	Instrumental Analysis II	2	
IL	275	Chemical Statistics I		1	0	IL	282	Physical Chemistry II	1	
			TOTAL	7	+	23=30	IL	291	Glass Blowing	0

Sixth Quarter									
Phys	256	Optics and Modern Physics		4	0	Phys	256	Optics and Modern Physics	4
Ind Rel	201	Industrial Relations		2	0	IL	273	Stoichiometry	1

IL	255	Industrial Organic Chemistry	2	8
IL	263	Instrumental Analysis III	2	9
IL	272	Stoichiometry II	2	0
IL	276	Chemical Statistics II	1	0
		TOTAL	13	+ 17=30

## CHEMICAL RESEARCH TECHNOLOGY

First Year (Same as Chemical Technology Curriculum)

### SECOND YEAR

Fourth Quarter										
ET	202	Electronics I		4	4	Lect.		Lab.		
IL	253	Aromatic Organic Chemistry		2	9	ET	202	Electronics I	2	
IL	261	Instrumental Analysis I		2	9	IL	253	Aromatic Organic Chemistry	1	
			TOTAL	8	+	22=30	IL	261	Instrumental Analysis I	2
							IL	281	Physical Chemistry I	1
							Math	204	Calculus II	3

Fifth Quarter										
Engl	204	Report Project		0	3	Lect.		Lab.		
ET	203	Electronics II		0	2	Engl	204	Report Project	0	
IL	254	Advanced Organic Chemistry		2	9	ET	203	Electronics II	0	
IL	262	Instrumental Analysis II		2	9	IL	254	Advanced Organic Chemistry	1	
IL	271	Stoichiometry I		2	0	IL	262	Instrumental Analysis II	2	
IL	275	Chemical Statistics I		1	0	IL	282	Physical Chemistry II	1	
			TOTAL	7	+	23=30	IL	291	Glass Blowing	0

Sixth Quarter										
Phys	256	Optics and Modern Physics		4	0	Phys	256	Optics and Modern Physics	4	
Ind Rel	201	Industrial Relations		2	0	IL	273	Stoichiometry	1	
			TOTAL	7	+	23=30	IL	277	Chemical Statistics I and II	2
							Ind Rel	201	Industrial Relations	2
							IL	255	Industrial Organic Chemistry	2
							IL	263	Instrumental Analysis III	0
							IL	283	Physical Chemistry III	1



## INDUSTRIAL PRODUCTION TECHNOLOGY

September 16, 1964, to May 19, 1965

Fees for each year \$54.00 plus Registration Fee of \$5.00

This can be called a machine age where mechanical devices of great complexity are being exploited in every phase of industry. At the same time competition is stimulating a keen awareness of

production costs and how these are influenced by effective plant organization.

Production Technology is basically the application of science to manufacturing and concerns itself with the planning and control of production as well as the production processes. Production planning involves the analysis of a product to determine the methods best used for its manufacture within the framework of the organization. Thus it depends for its effectiveness upon a detailed knowledge of plant and machinery, plant layout, material costs, management and many other associated subjects. To this must be added a familiarity with raw materials and the methods by which they can be most efficiently manipulated.

Much of industry's potential is exerted towards the working of metal and the production technician whose interests lie in this direction will require training in such fields as mathematics, metallurgy, mechanics, physics, machine tools and manufacturing processes amongst many others.

The graduate can expect employment in the fields of production control, estimating, sales, planning or mechanical design, and with experience and further study should gain promotion to positions such as plant superintendent, works manager or planning supervisor. If therefore, the prospective student is practically inclined, creative and has an interest in the manufacture of the numerous products which contribute so greatly towards our modern civilization, then Industrial Production can prove itself to be a most satisfying and lucrative career.

Preference will be given to applicants who have a minimum of 67 Alberta High School credits, or equivalent, including at least a "B" standing in Math 20 or 22, Science 20 or 22, and English 20. A transcript of high school marks, or other documentary proof must accompany each application. (See back of application form.)

### Textbooks and Tools:

Students are required to provide their own textbooks, drafting instruments, coveralls and certain hand tools. Most of these items will be available at the institute, and should not be purchased until the student has met with his instructors. Approximate cost 1st year \$100.00 and \$50.00 2nd year.

# COURSE OUTLINE

## FIRST YEAR

### First Quarter

			Lect.	Lab.				
Math.	111	Algebra and Geometry	5	0	Math.	214	Calculus II	3
Engl.	101	Introductory Technical English	3	0	Engl.	204	Report Project	0
Phys.	101	Heat, Sound and Optics	4	2	CT.	141	Strength of Materials I	3
IP.	100	Introduction to Production Engineering	1	0	HD.	111	Thermodynamics I	3
DT.	101	Elementary Drafting	3	3	IP.	224	Manufacturing Processes IV	5
IL.	101	Inorganic Chemistry	3	3	IP.	232	Theory of Machines	2
IP.	121	Manufacturing Processes I	2	1	IP.	241	Estimating I	2
			TOTAL	21	+ 9=30			

## SECOND YEAR

### Lect. Lab.

### Fourth Quarter

Math.	214	Calculus II	3	0
Engl.	204	Report Project	0	3
CT.	141	Strength of Materials I	3	0
HD.	111	Thermodynamics I	3	3
IP.	224	Manufacturing Processes IV	5	3
IP.	232	Theory of Machines	2	1
IP.	241	Estimating I	2	2
		TOTAL	18	+ 12=30

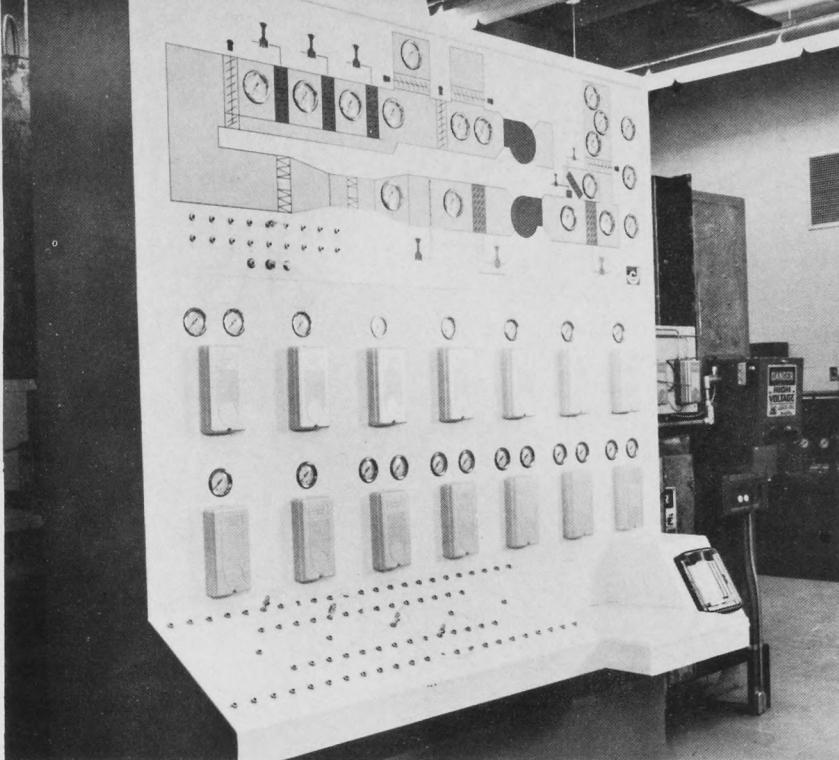
### Second Quarter

Math.	112	Trigonometry	5	0	CT.	273	Hydraulics	2	2
Engl.	102	Communication Skills	3	0	HD.	212	Thermodynamics II	2	2
IP.	131	Applied Mechanics	4	2	IP.	225	Manufacturing Processes V	2	6
DT.	145	Mechanical Drafting I	1	3	IP.	242	Estimating II	1	2
IE.	101	Electricity I	2	2	IP.	251	Machine Design I	2	2
MT.	131	Basic Metallurgy	2	1½	IP.	261	Methods Engineering	2	1
IP.	122	Manufacturing Processes II	3	1½	IP.	271	Metrology I	2	2
		TOTAL	20	+ 10=30			TOTAL	13	+ 17=30

### Fifth Quarter

### Sixth Quarter

Math.	113	Calculus I	3	0	IndRel.	202	Industrial Relations	4	0
Engl.	103	Data Presentation	3	0	IP.	226	Manufacturing Processes VI	2	5
DT.	146	Mechanical Drafting II	1	3	IP.	233	Pressure Vessel Design	2	3
IE.	102	Electricity II	1	2	IP.	252	Machine Design II	2	3
MT.	204	Properties of Materials	3	3	IP.	262	Plant Layout	2	2
IP.	123	Manufacturing Processes III	3	3	IP.	272	Metrology II	2	3
IP.	132	Applied Mechanics II	3	2			TOTAL	14	+ 16=30
		TOTAL	17	+ 13=30					



# INSTRUMENTATION TECHNOLOGY

## TWO-YEAR COURSE

September 16, 1964, to May 15, 1965

Fee for each year \$54.00 plus Registration Fee of \$5.00

The objective of this course is to train Instrument Technicians specially suited for our continually expanding Western industries. As such, the course has an unlimited scope for the imaginative mind, and a good technician can expect to attain a great deal of personal satisfaction for his work, as well as command a good salary.

The science of Automation is rapidly altering the face of Industry. Instruments and control systems are taking over the functions of decision-making and thinking, and are already performing many tasks better and at a lower cost than humans are able to do.

The Instrument Technician (or "Automation Technician" as he might be called) is of key importance in this new development. His job is to install, put into operation and maintain the required control systems, the operation of which can be compared to the functioning of the human nervous system.

Automation will accelerate the development of Canadian natural resources. One such case is the development of the Alberta Tar Sands, in which the oil industry proposes to spend over \$500 million. This will involve the extensive use of automatic controls.

The capital investment in Alberta industries is estimated to double in the next ten years. The petroleum, natural gas, petro-chemical, metallurgical, food-processing, wood, pulp and paper and power-generating industries will be prominent in this expansion. All will require an increasing number of Instrument Technicians. Some of them may be chosen for certain supervisory positions because of their combined knowledge of automatic controls and operations.

The course is designed to meet the challenge of this rapidly expanding field. The Instrumentation Laboratory will be one of the best equipped in North America, and will feature actual process units with functioning controls. The student will obtain realistic practical experience and will be trained to think creatively. He will be capable of making adaptations and modifications to his equipment; at the same time will be given thorough training in fault-finding, repair and maintenance.

Preference will be given to applicants who have a minimum of 100 Alberta high school credits, or equivalent, including at least a "B" standing in Math 30, 31 or 32, Science 20 and English 20. A transcript of high school marks, or other documentary proof, must accompany each application.

Books and supplies will cost approximately \$100.00 for the first year.

# COURSE OUTLINE

## FIRST YEAR

First Quarter			Lect.	Lab.
Math.	121	Analytical Geometry and Basic Trigonometry	3	0
Engl.	101	Introductory Technical English	3	0
ET.	110	Basic Electricity and Electronics	5	0
ET.	115	DC and AC Fundamentals Lab.	0	6
IP.	105	Pipe and Tube Fitting	0	3
IT.	100	Mechanics and Force Fields	8	2
		TOTAL	19	+ 11=30

## SECOND YEAR

		Lect.	Lab.
Phys.	213	Modern Physics	3 0
DT.	205	Elementary Drafting	1 3
ET.	274	Electronics Lab. III	0 6
IL.	207	Inorganic Chemistry	3 0
IT.	203	Instrumentation III	4 0
IT.	213	Instrument Maintenance III	0 6
IT.	204	Mass Transfer and Rate Processes	4 0
		TOTAL	15 + 15=30

## Second Quarter

Math.	122	Practical Analysis, Vectors	3	0
Engl.	102	Communication Skills	3	0
IT.	103	Fluid Dynamics	2	0
ET.	117	Electronics Lab. I	0	6
ET.	124	Basic Electronics Circuits	6	0
IP.	106	Machine Shop II	0	2
IT.	101	Instrumentation I	3	0
IT.	111	Instrument Maintenance I	0	5
		TOTAL	17	+ 13=30

## Fifth Quarter

IL.	208	Organic Chemistry	2 0
Engl.	204	Report Project	0 3
DT.	271	Electronic Drafting	0 3
IP.	113	Painting and Panel Fabrication	1 2
MT.	205	Methods of Material Production I	3 0
IT.	221	Automatic Control I	4 4
IT.	231	System Fault Analysis	0 8
		TOTAL	10 + 20=30

## Third Quarter

Math.	127	Calculus	6	0
Engl.	103	Data Presentation	3	0
ET.	118	Electronics Lab. II	0	6
ET.	135	Electronic Measurements	4	0
ET.	173	Industrial Electronics	3	0
IT.	102	Instrumentation II	3	0
IT.	112	Instrument Maintenance II	0	5
		TOTAL	19	+ 11=30

## Sixth Quarter

IndRel.	201	Industrial Relations	2 0
DT.	206	Process Control Drafting	0 3
MT.	206	Methods of Material Production II	3 0
IT.	222	Automatic Control II	1 4
IT.	232	System Applications.	0 8
IT.	251	Computers	3 4
IT.	271	Analytical Instruments	2 0
		TOTAL	11 + 19=30



## MATERIALS TECHNOLOGY

### TWO-YEAR COURSE

September 16, 1964 to May 19, 1965

Fees for each year \$54.00 plus Registration Fee of \$5.00

The proper selection, application, inspection and use of the many materials available today for any one purpose is a fascinating business, and it is in this field that the Materials Technician makes his home.

Metals, plastics, concrete, asphalt, rubber, ceramics, soils, and glass are typical of the materials the student will study for their uses, properties and so on.

A complete mechanical testing laboratory will be provided, as well as facilities for microscopic analysis and heat treatment of metals.

Non-destructive testing involving the use of X-ray, gamma-ray (isotope), magnetic particle and ultrasonic equipment promises to be one of the most valuable and interesting aspects of the program. Many technicians are and will be employed in this field. For example, almost every weld on every pipeline in Alberta, and on over one hundred thousand miles of pipeline in North America, has been tested for soundness using these methods.

Preference will be given to applicants who have a minimum of 100 Alberta high school credits, or equivalent, including at least a "B" standing in Math 30 or 32, Science 20 and English 20. A transcript of high school marks, or other documentary proof must accompany each application. (See back of application form.)

### COURSE OUTLINE

#### FIRST YEAR

First Quarter		Lect.	Lab.
Math. 101	Analytical Geometry	5	0
Engl. 101	Introductory Technical English	3	0
Phys. 101	Heat, Sound, and Optics	4	2
DT. 101	Elementary Drafting	3	3
IL. 101	Inorganic Chemistry	3	3
MT. 101	General Properties of Materials	2	2
	TOTAL	20	+ 10=30

#### Second Quarter

Math. 102	Trigonometry	5	0
Engl. 102	Communication Skills	3	0
Phys. 102	Sound, Heat, Light, Electricity and Magnetism	4	2
CT. 111	Statics I	3	0
IL. 104	Quantitative Analytical Chemistry	3	3
MT. 111	Destructive Testing I	0	3
MT. 131	Basic Metallurgy	2	2
	TOTAL	20	+ 10=30

**Third Quarter**

Math.	103	Calculus I	3	0				
Engl.	103	Data Presentation	3	0				
Phys.	103	Modern Physics	3	3				
IL.	105	Physical Chemistry	3	3				
IP.	111	Welding	1	2				
PT.	102	Dark Room Procedures	1	2				
MT.	121	Non-Destructive Testing I	3	3				
			<b>TOTAL</b>	<b>17</b>	<b>+</b>	<b>13=30</b>		

**Fifth Quarter**

CT.	151	Soil Mechanics I	2	3
IP.	102	Machine Shop	1	2
Con.	225	Construction Materials and Specifications	2	2
MT.	212	Destructive Testing II	1	3
MT.	222	Non-Destructive Testing II	0	3
MT.	233	Physical Metallurgy II	3	3
MT.	241	Properties of Non-Metallics I	3	2
		<b>TOTAL</b>	<b>12</b>	<b>+</b>
			<b>18=30</b>	

**SECOND YEAR****Fourth Quarter**

			<b>Lect.</b>	<b>Lab.</b>				
Math.	204	Calculus II	3	0				
Engl.	204	Report Project	0	3				
CT.	131	Concrete	2	2				
CT.	213	Dynamics	2	0				
IL.	201	General Organic Chemistry	3	3				
IP.	101	Machine Shop I	1	2				
IT.	204	Instrumentation	2	2				
MT.	232	Physical Metallurgy I	2	3				
			<b>TOTAL</b>	<b>15</b>	<b>+</b>	<b>15=30</b>		

**Sixth Quarter**

IndRel.	201	Industrial Relations	2	0
CT.	252	Soil Mechanics II	0	3
CT.	254	Asphalt and Soil Cement	0	3
MT.	223	Non-Destructive Testing III	2	3
MT.	234	Physical Metallurgy III	3	3
MT.	242	Properties of Non-Metallics II	0	3
MT.	251	Material Specifications	3	0
MT.	261	Technical Project	0	3
MT.	271	Material Balance	2	0
		<b>TOTAL</b>	<b>12</b>	<b>+</b>
			<b>18=30</b>	

# MEDICAL LABORATORY TECHNOLOGY

## TWO-YEAR PROGRAM

8 September, 1964 - 25 June, 1965, NAIT

September, 1965 - October, 1966, Affiliated Hospital

Fees \$54.00—Tuition NAIT

5.00—Registration NAIT

10.00—Student Registration CSLT

In the hospitals, government laboratories and clinics in Canada there is an increasing demand for technicians to perform pathological laboratory examinations to aid the physician and surgeons in the diagnosis and treatment of disease.

This two-year program, developed by the Institute with the co-operation of the four hospital training schools in Edmonton is designed to train such personnel. It is expected that in future years this scheme will be enlarged to incorporate training hospitals in other large Alberta centers such as Calgary and Lethbridge. The first ten-month period of the program which is taken in the Northern Alberta Institute of Technology is split into two, five-month semesters intended to acquaint the student with the basic principles of instrument operation, chemical tests and other laboratory procedures. Some subjects curricula will be completed by the end of the first semester and examinations given at that time will be final examinations for those subjects within the Institute.

In the second year, students' knowledge and ability is broadened by the actual application of theories and the developing of technical skills by the performance of routine and special tests in a hospital laboratory.

Successful completion of the two-year training program leads, after external examination in all subjects, to registration with the Canadian Society of Laboratory Technologists.

Students seeking admission to NAIT in the Medical Laboratory program must have as minimum academic qualifications Senior Matriculation (Alberta) or its equivalent, with credits in Mathematics



30, Chemistry 30, Physics 30 or Biology 32, and an overall average of at least 60%.

Interested students from anywhere in Alberta should, in the first instance, make application to the Director of Laboratory Services in any one of the following Edmonton Hospitals, not the Institute:

GENERAL HOSPITAL

MISERICORDIA HOSPITAL

ROYAL ALEXANDRA HOSPITAL

UNIVERSITY OF ALBERTA HOSPITAL

Applicants accepted by one of these hospitals will be referred to the Northern Alberta Institute of Technology by them when applicable.

#### TEXTBOOKS, SUPPLIES, UNIFORMS

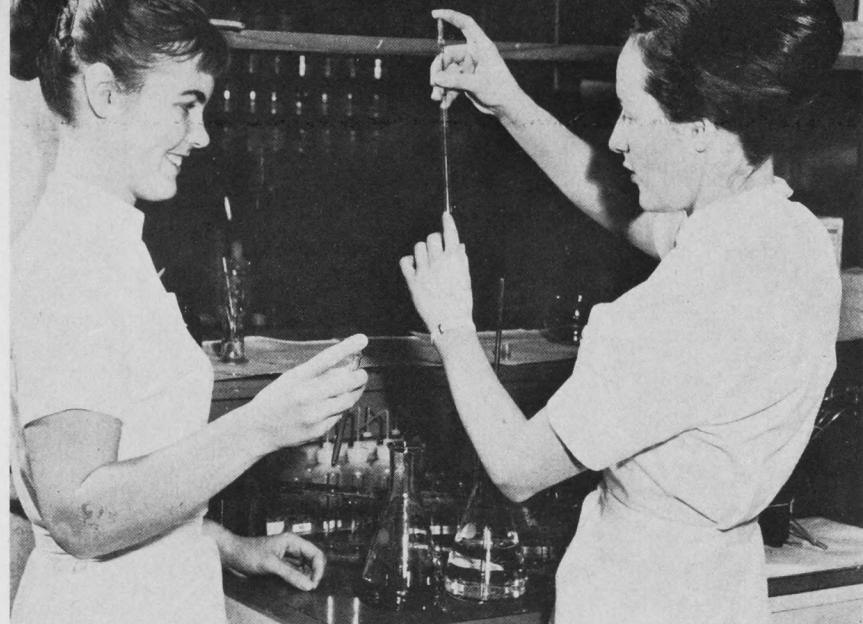
Female students at the Northern Alberta Institute of Technology will be required to purchase white uniforms and shoes. Male students will be required to purchase white laboratory coats. The cost of these items plus textbooks, supplies, etc., should not exceed a total of \$80.00. Students are advised not to purchase any of these supplies until they have met their Instructors.

## MEDICAL LABORATORY TECHNOLOGY CURRICULUM

### FIRST SEMESTER

#### SEPTEMBER 8 - SEPTEMBER 18, 1964

		Lect.	Lab.	
ML.	101	Hospital Orientation	0	10
ML.	102	Laboratory Orientation	5	8
ML.	111	Bacteriology	4	8
		TOTAL	9	+ 26=35



#### SEPTEMBER 21 - JANUARY 29, 1965

Engl.	101-102	Introduction and Communication Skills	3	0
IL.	121	General Chemistry	2	0
ML.	102	Laboratory Orientation	8	9
ML.	111	Bacteriology	5	8
TOTAL			18	+ 17=35

### SECOND SEMESTER

#### FEBRUARY 1 - MAY 19, 1965

Engl.	102-103	Communication Skills and Report Project	3	0
ML.	121	Clinical Chemistry	5	10
ML.	131	Hematology	3	8
ML.	141	Histology	2	4
TOTAL			13	+ 22=35

#### MAY 20 - JUNE 25, 1965

ML.	121	Clinical Chemistry	8	10
ML.	131	Hematology	3	8
ML.	141	Histology	2	4
TOTAL			13	+ 22=35

# MEDICAL X-RAY TECHNOLOGY

## TWO-YEAR COURSE

Fees for each year \$54.00 plus Registration Fee of \$5.00

There will be two dates of admission each year to the Northern Alberta Institute of Technology for X-Ray Training. The students are referred to the X-Ray Section, Laboratory and Sciences Division, by the Accredited Training Schools in the Hospitals and Clinics.

### FALL CLASS

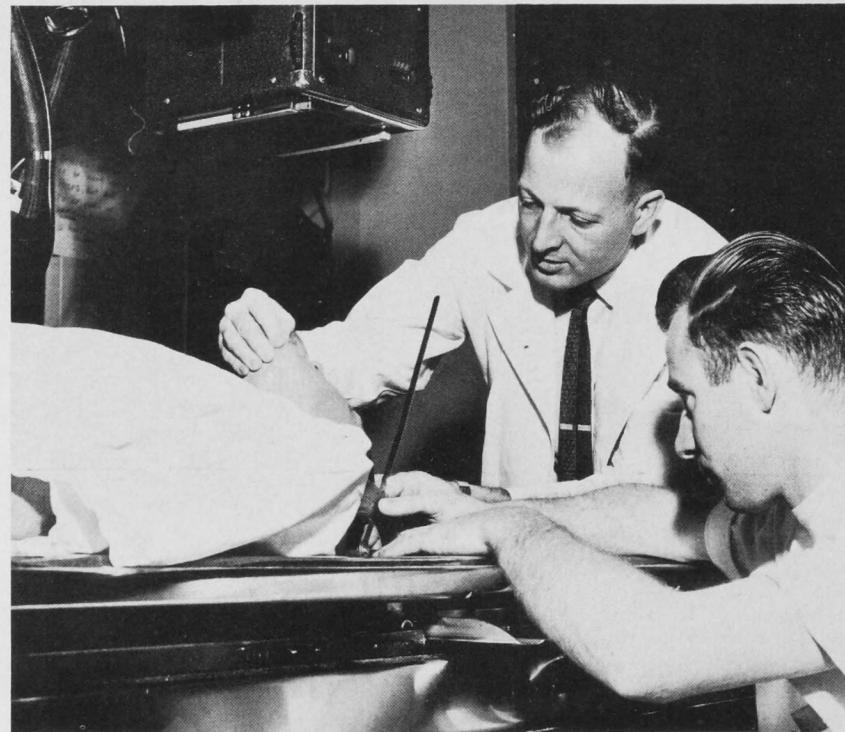
1st Year: September 2, 1964, to December 18, 1964.

2nd Year: January 4, 1965, to January 28, 1965.

### SPRING CLASS

1st Year: February 1, 1965, to May 28, 1965.

2nd Year: June 1, 1966, to June 30, 1966.



There is prior selection of the students by the accredited training schools in the X-Ray Department of Hospitals or Clinics. These schools have conformed to the Basis of Approval set down by the Canadian Medical Association. The students attending the Institute section of this co-operative training program, will be sponsored by these accredited training schools and are sent to the Northern Alberta Institute of Technology after having spent a period of evaluation and familiarization in the Hospital Department.

The Northern Alberta Institute of Technology is equipped with the finest of modern X-Ray machines and process laboratories but has not the facilities available to deal with radiological procedures undertaken during surgery or those involving a patient under general or local anaesthetic. Injection of opaque media and experience in relationships between technicians and a seriously ill or injured patient are only possible in the X-Ray Department or a hospital. Therefore a

co-operative training program between the Northern Alberta Institute of Technology and the Hospital Department has been devised, with the student receiving instruction and experience in these areas at the hospital.

Application should be made to the accredited Training School for X-Ray Technicians, Department of Radiology, at any of the Institutes listed below.

**EDMONTON**  
 University Hospital  
 Royal Alexandra Hospital  
 Misericordia Hospital  
 Edmonton General Hospital  
 Dr. S. C. Windle and Assoc.  
 Northgate Building  
 The Edmonton Cancer Clinic

**CALGARY**  
 Calgary General Hospital  
  
**RED DEER**  
 Parsons Clinic  
 Red Deer Municipal Hospital

The final month of the Institute course comes within the second year of training, when students will receive advanced lectures and review prior to writing the Canadian Society of Radiological Technicians National Examination for Registration. The accredited hospital training school will arrange for the student attendance at NAIT.

**Effective January 1st, 1965, Senior Matriculation will be a prerequisite. Until this date a student may be accepted with a High School Diploma and having a "B" standing or better in an aggregate total of 75% of their subjects.**

A genuine interest in people and their welfare is essential to Radiological Technicians. They must have the ability to work in harmony with members of the staff and other hospital personnel. Considerate and careful patient care is as important as technical excellence. The students invariably find the profession extremely interesting and rewarding. The work is varied and involves association with all departments within the hospital. X-Ray training is open to either male or female applicants, who meet the entrance requirements.

## COURSE OUTLINE

<b>I NAIT—1st Year</b>			<b>Lect.</b>	<b>Lab.</b>
XR.	101	Orientation	1	0
XR.	121	Electrical and Radiation Physics	2	1
XR.	122	Radiobiology I	1	0
XR.	131	Photographic Aspects of Radiography	4	1
XR.	141	Apparatus and Accessory Equipment I	4	1
XR.	151	Nursing Essentials	1	1
XR.	152	Anatomy and Physiology	5	0
XR.	153	Basic Medical Sciences	1	0
XR.	161	Radiographic Techniques	5	2
		<b>TOTAL</b>	<b>24</b>	<b>+</b> <b>6=30</b>

### **II NAIT—2nd Year**

XR.	203	Seminar	4	0
XR.	223	Radiobiology II	5	1
XR.	242	Apparatus and Accessory Equipment II	5	4
XR.	261	Radiographic Techniques II	5	4
		Office Procedure	1	0
		Radiographic Mathematics	1	0
		<b>TOTAL</b>	<b>21</b>	<b>+</b> <b>9=30</b>

Fee for NAIT Courses, \$54.00 plus \$5.00 Registration. Enquire at the accredited training school about other costs involving uniforms and registration at the hospital.

### **Textbooks, Supplies, Etc.:**

The cost of books and supplies, etc., should not exceed a total cost of \$60.00 for the entire course. Students are advised not to purchase any of these supplies until their needs have been outlined by their instructors.

# PHOTOGRAPHIC TECHNOLOGY

## TWO-YEAR COURSE

September 16, 1964, to May 15, 1965

Fees for each year \$54.00 plus Registration Fee of \$5.00

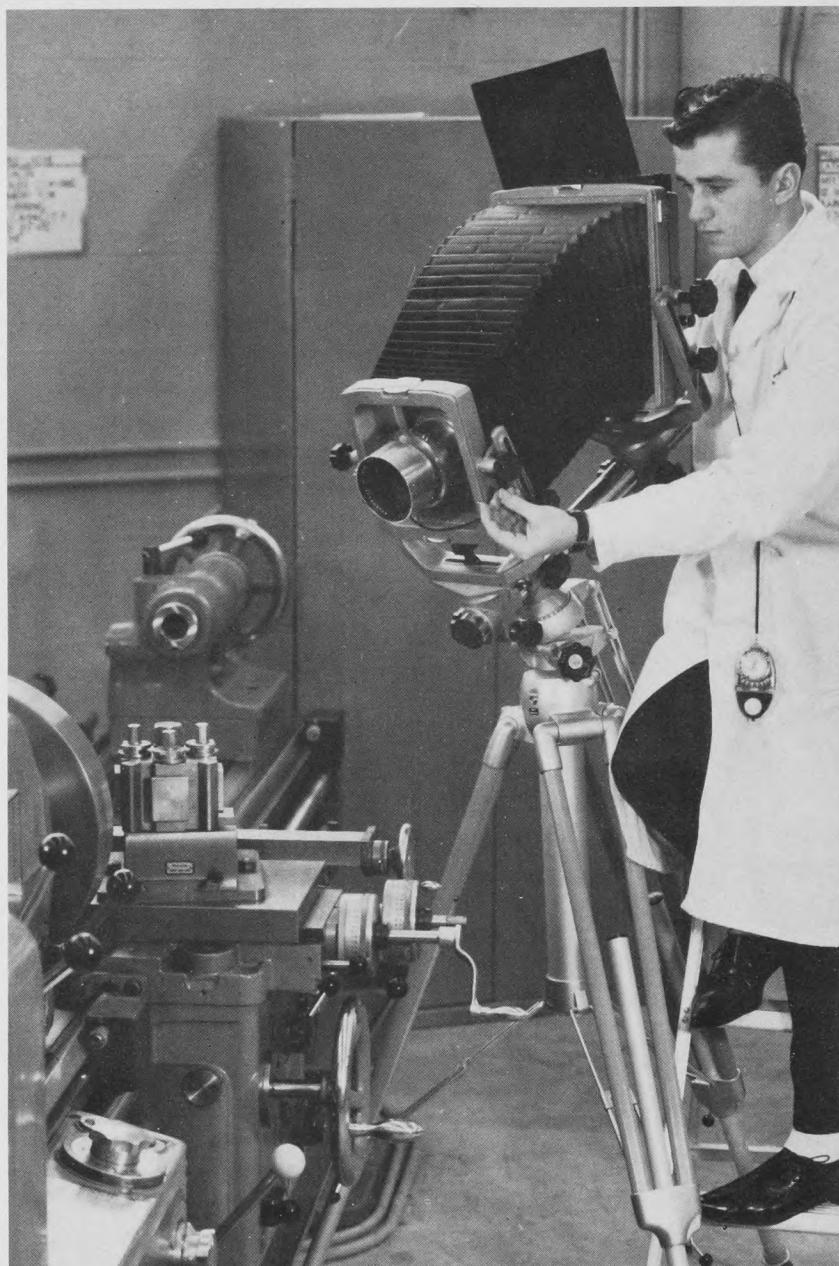
A thorough training in the basic arts and refinements of photography is an ever-increasing prerequisite for a successful career in the photographic field. The need for trained individuals in all walks of business and industry has placed photography in an area of importance vital to the growth of Canada.

This is a two-year course in Photographic Technology. Preference will be given to applicants who have a minimum of 67 Alberta high school credits, or equivalent, including at least a "B" standing in Math 20 or 22, Science 20 and English 20. A transcript of high school marks, or other documentary proof must accompany each application. (See back of application form.) Admission requirements may be waived for students with exceptional talent, and/or advanced standing may be allowed at the discretion of the Head of Department where warranted. The latter part of the course will provide two options for: (a) those intending to specialize, for example, in advanced studio and portrait work, commercial subjects, etc., or (b) those planning to enter the business field, for example, photography studio or wholesale and retail houses.

Approximately 50% of the student's time will be spent in practical work, 30% in theory related to photography and 20% in science and related subjects.

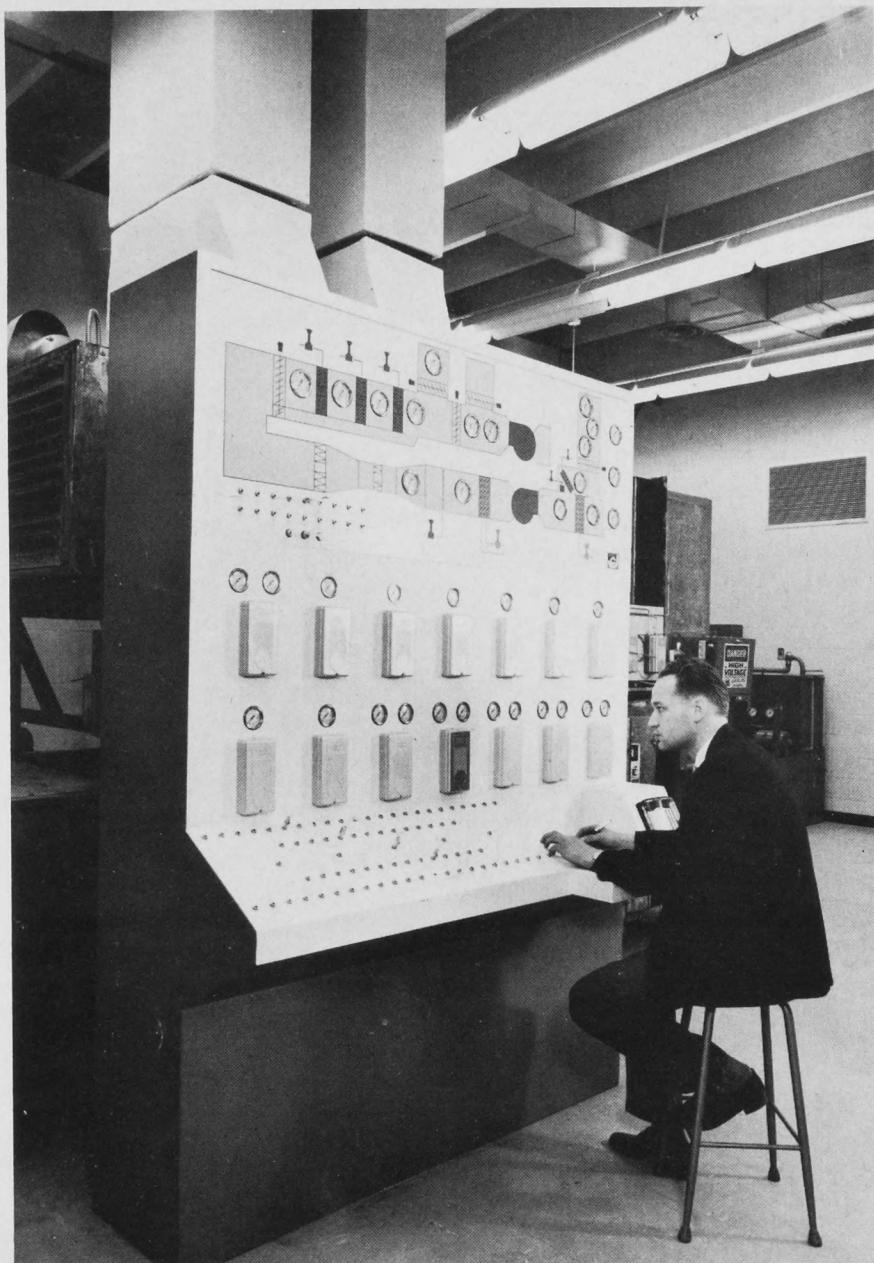
### Textbooks, Supplies, Etc.

The cost of books, photographic supplies, etc., should not exceed \$200 per year. Students are advised not to purchase any of these supplies until they have met their Instructor.



# COURSE OUTLINE

		<b>FIRST YEAR</b>		Lect.	Lab
<b>First Quarter</b>		Orientation and Guidance		1	0
Orient.	101	Introductory Technical English		3	0
Engl.	101	Introduction to Photography		3	0
PT.	101	Camera Control		4	5
PT.	111	Development Control		8	6
		TOTAL		19	+ 11=30
<b>Second Quarter</b>					
IL.	101	Inorganic Chemistry		3	3
PT.	113	Print Control		3	6
PT.	121	Applied Techniques		3	6
PT.	122	Aesthetics and Perspectives		2	4
		TOTAL		11	+ 19=30
<b>Third Quarter</b>					
Engl.	102	Communication Skills		3	0
Phys.	161	Electricity and Sound		4	2
IL.	111	Photo Chemistry		2	1
PT.	131	Black and White		4	8
PT.	132	Project		2	4
		TOTAL		15	+ 15=30
<b>Fourth Quarter</b>					
		<b>SECOND YEAR</b>		Lect.	Lab.
Phys.	262	Optics		4	2
PT.	204	Photo Employment Orientation		3	0
PT.	241	Introduction to Colour		6	15
		TOTAL		13	+ 17=30
<b>Fifth Quarter</b>					
IndRel.	201	Industrial Relations		3	0
PT.	242	Advanced Color		6	6
PT.	251	Specialization Option (Retail or Portrait and Commercial)		6	3
PT.	261	Audio-Visual		3	3
		TOTAL		18	+ 12=30
<b>Sixth Quarter</b>					
Bus.	212	Office Management		2	1
PT.	252	Advanced Option (Retail or Portrait and Commercial)		3	10
PT.	271	Motion Picture		4	10
		TOTAL		9	+ 21=30



# REFRIGERATION AND AIR CONDITIONING TECHNOLOGY

## TWO-YEAR COURSE

September 16, 1964, to May 19, 1965

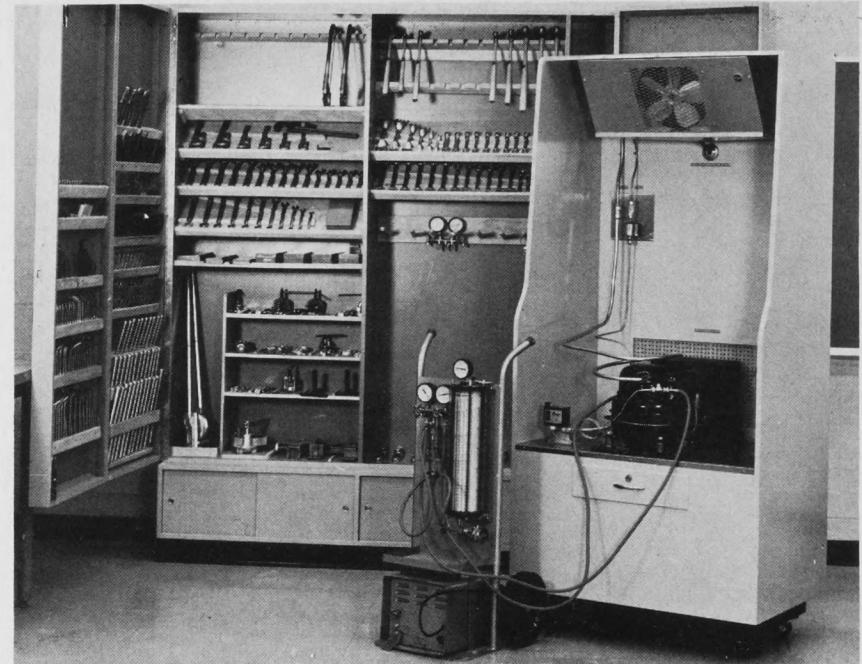
Fees for each year \$54.00 plus Registration Fee of \$5.00

The objective of this course is to provide trained technicians who can assist mechanical engineers—technicians who can work independently on the job or in a design office with a minimum amount of supervision.

Technicians in this field require a thorough knowledge of the fundamentals of refrigeration and air conditioning theory, as well as a thorough understanding concerning design of different types of air conditioning, refrigeration and heating systems and related automatic controls; heating and cooling load calculations; installation and servicing of refrigeration, air conditioning and heating apparatus, including automatic controls.

Instruction is also given in pipefitting, sheet metal work, and in other allied trades as they apply to the refrigeration and air conditioning industry.

Preference will be given to applicants who have a minimum of 67 Alberta high school credits, or equivalent, including at least a



"B" standing in Math 20 or 22, Science 20 and English 20. A transcript of high school marks, or other documentary proof must accompany each application. (See back of application form.)

### Tools:

6" screwdriver, 8" screwdriver, 6" side cutting pliers, a set of open-end wrenches covering the sizes from  $\frac{1}{2}$ " to  $1\frac{1}{8}$ ", a good jack knife,  $45^\circ$  and  $60^\circ$  set squares, set of drafting instruments, 6" long nose pliers, small screwdriver with  $3/16$ " blade, khaki smock or overalls.

Books and supplies approximately \$100.00.

Students are advised not to purchase tools until they have met their shop instructors who will recommend the quality of tools to be purchased.

# COURSE OUTLINE

## SECOND YEAR

First Quarter		Lect.	Lab.	Fourth Quarter		Lect.	Lab.			
Math.	121	Analytical Geometry and Basic Trigonometry	3	0	Math.	224	Trigonometry	3	0	
Engl.	101	Introductory Technical English	3	0	Engl.	204	Report Project	0	3	
Phys.	141	Liquids, Gases, Heat	3	0	Phys.	244	Mechanics	2	0	
DT.	103	Elementary Drafting	2	3	DT.	213	Piping Sketching	0	2	
IE.	127	DC Circuits and Meters	3	2	IE.	263	Instruments and Measurements	2	0	
IP.	101	Machine Shop I	1	2	IP.	212	Sheet Metal	1	2	
RA.	101	Basic Refrigeration	4	0	RA.	221	Basic Air Conditioning	5	0	
RA.	102	Basic Refrigeration Lab.	0	4	RA.	222	Basic Air Conditioning Lab.	0	6	
						RA.	231	Air Conditioning Controls I	2	2
								TOTAL	15	+ 15=30
				TOTAL	19	+ 11=30				
Second Quarter				Fifth Quarter						
Math.	122	Practical Analysis	3	0	Math.	225	Calculus I	3	0	
Engl.	102	Communication Skills	3	0	Phys.	245	Thermodynamics	2	0	
Phys.	142	Thermodynamics	3	0	DT.	214	Mechanical Detail Drawing	0	2	
DT.	111	Detailing	0	3	IE.	273	Protective Devices and Controls	2	0	
IE.	128	DC and AC Circuits	3	2	IP.	111	Welding	1	2	
IP.	102	Machine Shop II	1	2						
RA.	103	Refrigeration Equipment	4	0						
RA.	104	Refrigeration Equipment Lab.	0	6						
				TOTAL	17	+ 13=30				
Third Quarter				Sixth Quarter						
Math.	123	Equality	3	0	Phys.	246	Optics	2	0	
Engl.	103	Data Presentation	3	0	IndRel.	201	Industrial Relations	2	0	
DT.	112	Electrical and Mechanical Drafting	0	3	DT.	215	Estimating and Design	0	2	
IE.	145	Electrical Machines and Controls	3	4	IE.	217	Wiring Practice and Codes	2	0	
RA.	105	Refrigeration Systems	6	0	RA.	225	Air Conditioning Systems	5	0	
RA.	106	Refrigeration Systems Analysis	0	8	RA.	226	Air Conditioning System Analysis	0	10	
				RA.	233	Air Conditioning Controls III	3	4		
						TOTAL	14	+ 16=30		
				TOTAL	15	+ 15=30				

# BUSINESS AND VOCATIONAL DIVISION

Within the past decade a perceptible change has taken place in the composition of business and industry's work force. For the first time in history, professional, office and sales workers have exceeded in numbers the skilled, semi-skilled and unskilled manual workers. The implications contained in this fact plus the forecast for the coming ten years holds great significance for those people who are now determining their future careers.

The biggest increase in employment opportunities is expected in areas requiring the most education and training. The increasing size and complexity of business organizations, while opening the doors to expanding numbers of employment opportunities, at the same time demands that many positions requiring highly specialized training be included in this increase. Studies of labor force requirements for the next ten years further indicate that the number of women workers will increase at nearly twice the rate for men. It is probably reasonable to expect therefore that because of the greater numbers of women expected to be employed in the future, that those business occupations in which they are predominantly employed, will require far more intensive and specialized preparation than is now the case.

The objective of this Division is therefore to provide training in a choice of business occupations and other vocations to both men and women alike that will prepare students with the skills and knowledge necessary to enable them to earn their livelihood. An effort has been made to accommodate those with varying educational backgrounds by providing programs with different entrance requirements. Some courses are designed for those who have not completed high school who wish to receive occupational instruction, but who are over the compulsory school attendance age.

Other programs are provided exclusively for training of the unemployed who are referred to the Division by the National Employment Service and Canadian Vocational Training representatives.

In addition, advanced programs at a post-high school level, primarily in the Business field are included.

## BUSINESS AND VOCATIONAL DIVISION PROGRAMS

### 1. Business Programs

Business training at a post-high school level is provided in the following areas:

A one-year course in Banking; a one-year course in Data Processing; and a one-year program in Office Machine Repair. Two-year programs in Distributive Technology; Secretarial Technology and Business Administration with a second-year option in Accounting.

### 2. Secretarial Programs

A special program is offered in the areas of Clerk-Typist and in Secretarial training for students coming to the Institute through referral from Canadian Vocational Training Program and National Employment Service.

### 3. Trade and Vocational Programs

One of the most modern Institutional Food Service centers in Canada is to be found at the Northern Alberta Institute of Technology for the training of:

1. Apprentice Cooks
2. Apprentice Bakers
3. Waiters and Waitresses
4. Commercial Food Service Trainees.

For the homemaker, three short courses—Basic Clothing Construction, Advanced Dressmaking, and Tailoring are being offered to provide skills for personal use rather than for vocational purposes.

Trade courses in Barbering and Beauty Culture are available to students referred to the Institute by C.V.T. and N.E.S.

# BANKING

September 16, 1964, to May 15, 1965

Fees: \$54.00 per year plus \$5.00 Registration Fee

The ever-increasing growth and development of Canadian banking institutions has provided young people with unequalled career opportunities in a respected and established profession. To prepare those interested in entering the banking service, programs are being offered to train banking personnel at a Junior level.

Fundamental banking practices and skills are taught in modern laboratories and classrooms that will enable the graduate to adapt with a minimum of time and instruction to any of the various systems encountered in the different banks.

A review of banking systems will provide some detail of the individual bank operations.

Close co-operation between the Institute and a Banking Advisory Committee is maintained to ensure that the student receives the benefit of up-to-date and practical training.

In a laboratory designed to simulate a typical banking operation students are taught to use and develop skill on the various pieces of equipment commonly employed in banks, such as posting machines, proofing machines, sorters, etc. Actual experience in the varied clerical jobs is provided, supplemented by courses on theory, procedures and methods.



A review of the growth of the banks and some background of Foreign Exchange is also presented.

A further objective is to impart a sincere attitude of public service and business development.

Application for admission is made to the Registrar. Courses are scheduled to commence September 18, 1964, and complete May 15, 1965. Cost of books and supplies is estimated at \$65.00 for the year.

Preference will be given to students who are 17 years of age or over who have completed Grade Twelve.

## COURSE OUTLINE

### First Quarter

			Hours
B.	151	Typing	50
B.	141	Business Law	50
B.	105	Introduction to Banking	50
B.	175	Bank Bookkeeping	50
B.	191	Banking Laboratory	50
B.	223	Office Machines	50
			<hr/>
			300

### Second Quarter

B.	178	Bank Machines	50
B.	142	Business Law	50
B.	121	Business English	50
B.	131	Business Mathematics	50
B.	176	Bank Accounting	50
B.	192	Banking Laboratory	50
			<hr/>
			300

### Third Quarter

B.	226	Office Practice	50
B.	143	Business Law	50
B.	171	Credit and Collections	50
B.	177	Public Relations	50
B.	193	Bank Accounting	50
B.	195	Banking Laboratory	50
			<hr/>
			300



## BUSINESS ADMINISTRATION

September 16, 1964, to May 19, 1965

Fee for each year is \$54.00 plus Registration Fee of \$5.00

Modern business administration assures success to our trade and commerce. The purpose of this program is to provide the student with the necessary background training to permit him to serve responsibly and progress satisfactorily in business fields such as accounting, retailing, small business management, etc., as experience is gained and ability demonstrated.

The first year in Business Administration is a study of general business which includes basic subjects, accounting, economics, credit and collection, business law and business principles. These subject areas, along with others, are relevant to all business activity and include the fundamentals of theory and application. Courses in oral and written English assist the student in developing the skill of communication which is essential to our complex business world of today.



## TWO MAJOR PATTERNS

Students who are promoted into the second year and have satisfied the necessary prerequisites may choose from two major patterns: Accounting and General Business.

### 1. Accounting:

The opportunities in accounting are unlimited, e.g., accountants, auditors, credit managers, cost analysts, controllers, etc. Students entering the accounting major can expect to obtain the knowledge and skills essential to success in the business world. The curriculum provides the desired background to compute and analyze financial statements, verify records, and efficiently organize the work flow. Part of the course deals with written and oral communication, so important to our everyday life.

### 2. General Business:

This major is intended for those students who prefer broader training in business activities which might include wholesale or retail merchandising, buying, selling, office administration or small business management. The subjects covered are in sufficient detail to give a basic knowledge of the essentials necessary for entry into any of the above business endeavours.

Applicants must be over 17 years of age and preference is given to those who have completed Grade Twelve. Adult enrolment is considered on an individual basis. The approximate cost for texts and supplies is \$65.00 per year.

## BUSINESS ADMINISTRATION PROGRAM

### FIRST YEAR

First Quarter	Second Quarter
B. 101 Introduction to Business	B. 121 Business English
B. 115 Accounting Principles	B. 116 Accounting Principles
B. 181 Economics	B. 182 Economics
B. 131 Business Mathematics	B. 132 Business Mathematics
B. 141 Business Law	B. 142 Business Law
B. 151 Typing	BDP.195 Oral Communication

### Third Quarter

B. 122 Business English
B. 117 Accounting Principles
B. 183 Economics
B. 143 Business Law
B. 171 Credit and Collections
B. 144 Salesmanship

## SECOND YEAR

### General Business

#### First Quarter

- B. 262 Advertising
- B. 241 Retailing
- B. 251 Marketing Principles
- B: 231 Business Administration
- B. 261 Business Statistics
- B. 245 Personnel

#### Second Quarter

- B. 262 Advertising
- B. 242 Retailing
- B. 252 Marketing
- B. 232 Business Administration
- B. 265 Finance
- B. 235 Payroll Accounting

#### Third Quarter

- B. 227 Office Management
- B. 233 Business Administration
- B. 225 Sales Administration
- B. 215 Insurance
- B. 295 Inventory Control
- B. 275 Purchasing

### Accounting Option

#### First Quarter

- B. 211 Intermediate Accounting
- B. 291 Cost Accounting
- B. 251 Marketing Principles
- B. 281 Auditing
- B. 261 Business Statistics
- B. 245 Personnel

#### Second Quarter

- B. 212 Intermediate Accounting
- B. 292 Cost Accounting
- B. 282 Audit
- B. 223 Office Machines
- B. 265 Finance
- B. 235 Payroll Accounting

#### Third Quarter

- B. 227 Office Management
- B. 213 Intermediate Accounting
- B. 293 Cost Accounting
- B. 285 Income Tax
- B. 295 Inventory Control
- B. 275 Purchasing





## COMMERCIAL COOKING

September 8, 1964, to May 19, 1965, for 1st-year students

September 14, 1964, to May 19, 1965, for 2nd-year students

Fee for each year is \$54.00 plus Registration Fee of \$5.00

This course is designed to fill the growing need for men and women who are trained in the preparation of food on a large scale. Students are taught to prepare nutritious food in varied and attractive ways, and to purchase and handle supplies so that an establishment may operate at a reasonable profit, observing at all times the importance of cleanliness, sanitation and good public relations.

The first year of the course is intended to acquaint students with the basic principles of commercial cooking. This is accomplished by providing practical experience in the various cooking areas, as well as teaching the related theory and allied subjects by lectures and demonstrations.

In the second year, the knowledge gained in first year is broadened and deepened; emphasis is placed on quantity cooking and all phases of the culinary arts. Advanced food and pastry practise and the classical recipes of French cuisine are followed. The equipment used for this training is the most modern available.

Successful graduates of this course may look forward to well-paid positions in restaurants, hotel dining rooms, institutions, and catering establishments.

Applicants who are accepted for Food Service training must have a previous medical examination and submit a certificate of good health prior to class commencement.

Applicants must be 17 years of age or over.

Preference will be given to those who have a minimum of 35 Alberta high school credits or equivalent.

The cost of textbooks, tools and supplies should not exceed \$100 for both years. Students should not purchase tools or supplies until they have met with their instructors. (See page 17.)

Students registered in this program may apply for Food Service Scholarships.

## COURSE OUTLINE

### FIRST YEAR

			Hours
FS.	100	Theory of Food	120
FS.	101	Kitchen Management and Sanitation	50
FS.	104	Shopwork (Stations)	630
B.	131	Mathematics	50
B.	121	Business English	50
			TOTAL
			900

### SECOND YEAR

			Hours
FS.	200	Theory of Food	120
FS.	201	Kitchen Management and Sanitation	50
FS.	204	Shopwork (Stations)	630
B.	100	Record Keeping	50
		Elective	50
			TOTAL
			900



## DATA PROCESSING MACHINE OPERATOR'S COURSE

### ONE-YEAR COURSE

September 16, 1964, to May 19, 1965

Fees \$54.00 plus Registration Fee of \$5.00

Statistical forecasts indicate that the next ten years will open unlimited opportunities for people trained in the operation of computer and punched card data processing systems.

Sufficient data processing installations are presently in operation, with more being added yearly, to provide an expanding source of job opportunities for those trained in this field. For students who wish to qualify for employment at an operator level in those firms utilizing data processing methods, instruction is provided on the following machines; key-punch, verifier, sorter, collator, accounting machine, reproducing punch and calculator.

Students are provided with more than a knowledge of specific units of equipment; the importance of development in related areas such as systems, methods and procedures is brought to their attention and in its elementary forms has been incorporated with the practise and theory necessary to the understanding of the equipment itself. A solid image of the philosophy and future objectives of this industry is most important to every student.

Lectures in specialized subjects such as accounting are also provided as shown in the Course Outline.

#### N.B.:

Although all the principles of the keypunch machine will be included in this course, it is not designed for keypunch training where speed and accuracy are of prime importance. It is designed to provide students with training as Data Processing or "Tabulator" operators.

Preference will be given to students who have completed Grade 12. A Data Processing machine operator Aptitude Test will be given to all applicants prior to courses commencing. The results of this test will be used as an aid in indicating to the student the advisability of undertaking this course of study. A Programmer Aptitude Test will be administered to students reaching the 3rd Quarter. This will help to evaluate the possibility of a student advancing into the computer field.

Application for enrolment may be made to the Registrar. Courses commence on September 16, 1964, and complete May 19, 1965. The approximate cost for books and supplies is \$85.00.

## COURSE OUTLINE

### First Quarter

		Hours
BDP.	181	Data Processing I
BDP.	111	Accounting for Data Processing I
B.	101	Introduction to Business I
B.	151	Typing I
		<hr/> 300

### Second Quarter

BDP.	182	Data Processing II	150
BDP.	112	Accounting for Data Processing II	50
B.	131	Business Mathematics I	50
B.	221	Office Practice I	50
			<hr/> 300

### Third Quarter

BDP.	183	Data Processing III	150
BDP.	113	Accounting for Data Processing III	50
B.	121	Business English I	50
S.	212	Office Practice II	50
			<hr/> 300
		TOTAL	<hr/> 900



## OFFICE MACHINE REPAIR

### ONE-YEAR COURSE

September 16, 1964, to May 15, 1965

Fees: \$54.00 plus \$5.00 Registration

The objective of this course is to prepare students with the skills and knowledge necessary to obtain employment in the business machine repair field. The theory and principles involved in the repair of standard typewriters of various manufacture is covered in detail. Instruction progresses to more advanced electric typewriters, with an introduction to adding machines.

A student is expected to possess a sound basic knowledge of methods and practices at completion of the program. With this foundation to build upon, employers are able to provide specialized in-service training on their advanced equipment in minimum time.

The repair laboratory is completely equipped but students are required to provide their own textbooks and lab. smocks. The facilities of a Business Education Department are available nearby to provide lectures in shop management and related subjects.

Applicants must be over 17 years of age. Preference will be given to those that have completed grade eleven. Classes begin September 16th, 1964 and complete May 5th, 1965. Applications for admission should be directed to the Registrar.

### OFFICE MACHINE REPAIR COURSES

#### First Quarter

OM.	101A	Basic Typewriter Theory
OM.	101	Typewriter Laboratory (Standards)
OM.	111	Typing
IE.	106	Basic Electricity

#### Second Quarter

OM.	102A	Typewriter Design Principles
OM.	102	Typewriter Laboratory
B.	131	Business Mathematics
IP.	101	Machine Shop

#### Third Quarter

OM.	103	Office Machine Laboratory
B.	100	Record Keeping
IE.	107	Basic Electricity
B.	121	Business English



## DISTRIBUTIVE TECHNOLOGY

### TWO-YEAR COURSE

September 16, 1964, to May 19, 1965

Fees \$54.00 plus Registration Fee of \$5.00

The course in Distributive Education is concerned with providing the fundamental training necessary to enable persons to enter any of the occupations dealing with the distribution of goods and services. The ever increasing growth of mass distribution methods has resulted in unlimited career opportunities, as well as improved living standards for Canadians.

Typical distribution occupations are to be found in the distribution of commodities or services which have a unit price involving a large sum of money; e.g., Advertising, construction service, financial service, motor vehicles, real estate, transportation service, etc; or in occupations involved in the sales and distribution by retailers, wholesalers, jobbers or others, of goods and services requiring a sound and relatively high degree of technical knowledge of the uses of the commodity (e.g., Specialized equipment, parts or services).

Subjects taken in the Distribution Education course are selected to provide a general background of knowledge and skill that can be applied in any of the occupations noted. Because distribution involves selling at many stages in the total process, considerable attention will be given to this facet of the program, as well as basic business courses, particularly in the first year. A detailed description of courses is in preparation and will be available from the Registrar after May 30th, 1964.

Minimum educational requirements are 100 High School Credits or more. Consideration will be given, however, to adults who have had practical "on the job" experience. Applicants must be over 17 years of age.

Classes commence September 16th, 1964, and end May 18th, 1965, for the first year.



## FOOD SALES AND SERVICE

### Waiter and Waitress

September 16, 1964, to May 19, 1965

Fees \$24.00 plus a Registration Fee of \$5.00

Ten-week courses are offered starting Monday, September 28, 1964, January 4, 1965 and March 14, 1965. Applications should be submitted in advance for any one of the above dates.

The course provides opportunity for the development of the skills and knowledge which are necessary for entrance into the food serving industry. Experience will be provided in the many types of service. Students will have actual experience with the serving of food to guests. Menu knowledge and menu terminology, plus sanitation in serving, are discussed and explained thoroughly.

Successful graduates will find employment opportunities in the many types of catering and food service establishments.

Graduates will receive a Certificate after successfully completing the course.



# SECRETARIAL TECHNOLOGY

## TWO-YEAR COURSE

September 16, 1964, to May 19, 1965

Fees \$54.00 plus Registration Fee of \$5.00

The primary objective of this course is to provide advanced training for men and women in preparation for positions of responsibility in business that require a high degree of secretarial skill and knowledge. The responsibility assigned to secretarial personnel at this level varies with different employers, but the well qualified person should be able to assume responsibility for work performed in an office; should be able to exercise initiative and employ sound judgment concerning company policy; should be able to work with very little direction, supervision, or guidance and finally—possess all the skills required of general office staff.

Employment opportunities in secretarial work are not restricted to women. Some firms prefer hiring men who have such specialized training, to act as assistants to company executives. To provide the type of training necessary, the courses will be on a level comparable to that necessary for a person who eventually plans to obtain a "Certified Professional Secretary" certificate or equal.

Because the program is aimed at providing advanced training in preparation for a career in secretarial work for either men or women, it is necessary that prospective applicants will have had previous experience or qualifications that will allow them to meet the following entrance requirements:

1. Grade Twelve Diploma
2. Typing—35 words per minute
3. Shorthand—80 words per minute

Applicants must be 17 years of age or over. Classes commence September 16th, 1964, to May 18th, 1965, for the first year. The cost of texts and supplies should not exceed \$60.00 per year.

A detailed description of the course is in preparation and may be obtained from the Registrar after June 16th, 1964. Applications for admission may be obtained from the Registrar.



## LADIES' TAILORING AND DRESSMAKING

150 Hours—Short Course

Fee for this course is \$24.00 plus Registration Fee of \$5.00

The Institute is offering ladies' dressmaking at three levels:

1. Basic Clothing Construction, Basic Pattern Drafting
2. Advanced Dressmaking, Advanced Pattern Drafting
3. Tailoring

The aim is to provide women with training primarily for the development of sewing skills for personal use in the home. Applicants

who are applying for the advanced Dressmaking, but have not followed the Basic Clothing Construction at N.A.I.T. in 1963-1964 will be given the Basic Pattern Drafting first. Tailoring only after advanced dressmaking at N.A.I.T.

Enrolments will be accepted as follows:

**Monday and Thursday**—For Beginners.

**Wednesday**—For Advanced Dressmaking and Basic Pattern Drafting (for those not having had a previous course at N.A.I.T.).

**Thursday**—Tailoring (request previous N.A.I.T. sewing course in Advanced Dressmaking).

**Friday**—Advanced Dressmaking, Advanced Pattern Drafting.

Entrants must be over 17 years of age. There are no special requirements for admission other than interest and ability to do the work. Students enrol for one day per week only. Classes are in session from 9-12 a.m. and 1-4 p.m. each day, Monday to Friday.

Enrolments will be accepted as received up until the time all classes are filled. Insofar as timetabling and class admissions will permit, an effort will be made to schedule classes to allow as many as possible to attend on the day of their choice.

Application forms may be obtained by contacting the Registrar.

Course Commencement: September 30th, 1964.

Course Termination: Mid-April, 1965.

# APPRENTICESHIP DIVISION

## Course Outlines

The Division offers Apprenticeship Courses, Technology subjects, Pre-Employment Courses, Refresher Courses for Journeymen, and Special Courses for tradesmen.

Course outlines for Apprentices come to the Institute from the Provincial Apprenticeship Board, Edmonton Office. They are in harmony with the Dominion Trade Analyses and are approved by the Provincial Trade Advisory Committees. Revisions to the outlines are made from time to time, in keeping with current trade practices. Institute Staff members participate in the writing and revision of outlines.

Each Department of the Division, in addition to training Apprentices, participates in the training of Technicians of the Industrial Technician field. The Electrical Department Staff provides laboratory and theory instruction for two technologies: Industrial Electrical and Refrigeration and Air Conditioning. The Metals Department does likewise for Industrial Production Technology, and the Automotives-Diesel Department for the Heavy Duty Equipment Technology. Service courses are provided for other technologies by the Construction, Metals, Electrical and Automotives-Diesel Departments. Course outlines are prepared by N.A.I.T. and S.A.I.T. staff members in co-operation with Advisory Committees. Course descriptions are given in this calendar.

In trade occupational areas when there are no designated (Alberta) trades, or where there is apparent need and when facilities permit at this Institute, Pre-employment, Refresher and Special Courses are offered. Course outlines are prepared by the Institute Staff in co-operation with trade groups, Government Agencies and Departments.

As the Institute develops, its work in the field of advanced training for Journeymen will become more and more important. The Staff, equipment, and facilities are available to share in programs which will help Canadians meet the challenges of industry and of international competition.

## Divisional Organization

Some 3,000 Apprentices from the Alberta designated trades are attending courses at the Institute during the 1963-64 term. An equal number is expected in the 1964-65 term. In years to come, however, with the opening of the Vocational High Schools, it is possible that

relatively fewer beginning Apprentices will attend courses at the Institute. Possibly more senior Apprentices will attend.

The following courses are offered in the 1963-64 term:

### Automotives-Diesel Department

First, Second, Third and Fourth Year Motor Mechanics  
First, Second, Third and Fourth Year Auto Body Mechanics  
First, Second, Third and Fourth Year Heavy Duty Diesel Mechanics

### Construction Department

Basic and Senior Bricklayers  
First, Second, Third and Fourth Year Carpenters  
First, Second and Third Year Painters and Decorators  
Basic and Senior Plasterers

### Electrical Department

First, Second, Third and Fourth Year Construction Electricians  
First, Second, Third and Fourth Year Power Electricians  
Basic, A, B, and C Courses for Communications Electricians

### Metals Department

First, Second, Third and Fourth Year Plumbers  
First, Second, Third and Fourth Year Steamfitters  
First, Second, Third and Fourth Year Sheet Metal Mechanics  
First, Second and Third Year Welders  
Basic, Senior, Gasfitters

### Related Subjects Section

This section provides instruction in trade mathematics, trade science, English, Blueprint Reading, Drafting, Layout, and Business Knowledge for courses offered in the Division.

**Apprentice Cooks and Bakers** receive laboratory and theory instruction in the Food Service Department of the Business and Vocational Division.

**Apprentice Radio-T.V. Repairmen** attend classes in the Electronics Department of the Technology Division.

Subject instruction for the Pre-Employment Courses, Refresher, and Special Courses is provided by the Departments concerned.

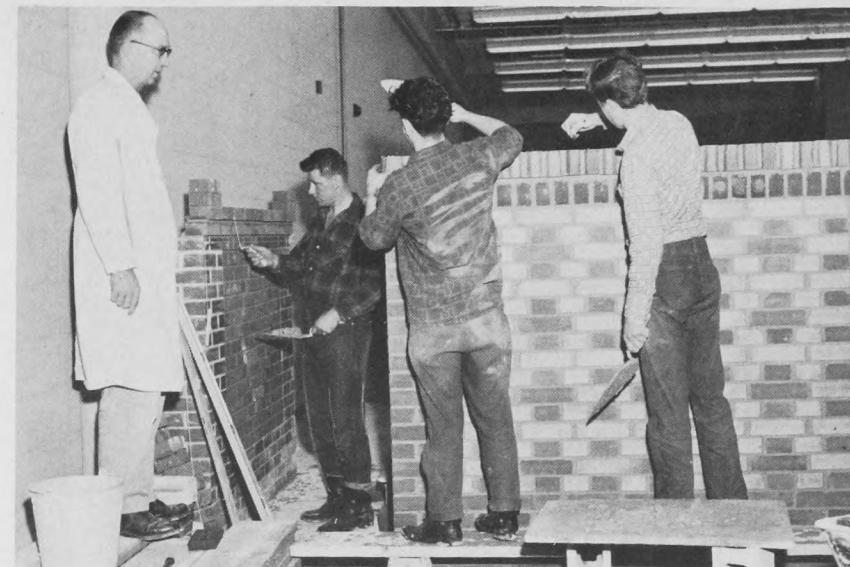
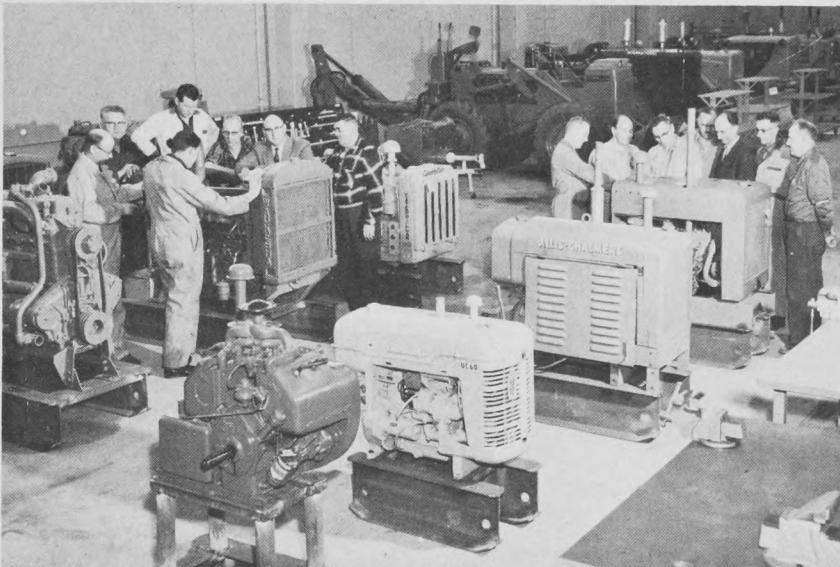
Some details regarding Apprenticeships in the 24 designated trades in Alberta are given in the table.

## APPRENTICESHIP TRADES IN ALBERTA

TRADE	YEARS OF TRAINING	SCHOOL TRAINING PROGRAM*				MINIMUM PAY RANGE**	DEMAND FOR APPRENTICES	MINIMUM EDUCATION
		1ST	2ND	3RD	4TH			
MOTOR MECHANIC	4	8	8	6	6	55%-85%	Good	Grade IX
AUTO BODY MECHANIC	4	5	5	5	4	55%-85%	Good	Grade IX
HEAVY DUTY MECHANIC	4	6	6	6	6	55%-85%	Improving	Grade IX
BRICKLAYER	4	8	(8)		8	50%-85%	Fair	Grade IX
CARPENTER	4	8	8	8	8	50%-90%	Normal	Grade IX
PAINTER AND DECORATOR	3½	4	8	8	—	40%-90%	Fair	Grade IX
PLASTERING	4	4	—	—	6	40%-90%	Fair	Grade IX
TILESETTING AND TERRAZZO	4		Pending			50%-85%	Slight	Grade IX
COMMUNICATIONS ELECTRICIAN	4	8	8	8	8	40%-75%	Normal	Grade X
CONSTRUCTION ELECTRICIAN	4	8	8	8	8	40%-75%	Good	Grade X
POWER ELECTRICIAN	4	8	8	8	8	40%-75%	Normal	Grade X
RADIO AND T.V. TECHNICIAN	4	8	8	8	8	50%-80%	Improving	Grade X
APPLIANCE SERVICEMAN	4	8	8	8	8	55%-85%	Improving	Grade X
REFRIGERATION	4	8	8	8	8	50%-85%	Fair	Grade IX
PLUMBING	4	6	6	6	6	40%-90%	Normal	Grade IX
GASFITTING	3	3	—	3	—	40%-90%	Normal	Grade IX
STEAMFITTING	4	6	6	6	6	40%-90%	Normal	Grade IX
SHEET METAL MECHANIC	4	10	8	6	8	40%-90%	Normal	Grade IX
WELDER	3	6	6	4	—	60%-90%	Normal	Grade IX
MACHINIST	4	8	8	8	8	55%-85%	Fair	Grade X
MILLWRIGHT	4		Discontinued			45%-85%	Slight	Grade IX
LATHER	3		Discontinued			55%-85%	Slight	Grade VIII
BAKER	3	8	8	—		50%-85%	Improving	Grade IX
COOK	3	8	8	—		50%-85%	Fair	Grade VIII

\*Weeks in each year of apprenticeship.

\*\*Of the prevailing Journeyman wages.



Apprentice Courses for Refrigeration Mechanics and Machinists are offered at the S.A.I.T. only. Bricklaying, Power Electrical, Communications Electrical, Painting and Decorating, Plastering, Steamfitting, and Baking courses are offered at N.A.I.T. only. Provision is made for all other apprentice courses at both Institutes (Calgary and Edmonton), with the exception of Millwrighting. At the present time no formal course for Millwrights is offered at either Provincial Institute.

#### Standards

Achievement by Apprentices attending Institute courses is measured in many ways. Instructors use weekly, mid-term, or final tests as required for the particular subject. Record is kept of laboratory or shop work done. Committees of Instructors meet to assess general progress made.

In addition to Institute tests and examinations, Apprentices write external examinations administered by Staff of the Provincial Apprenticeship Board. Progressive examinations, written and practical, are attempted by first and second year Apprentices, and by third year Apprentices in four year programs. "Final" examinations are third or fourth year Apprenticeship Examinations, Tradesmen's Qualification Examinations, Qualification Examinations, and for six trades the Inter-Provincial examinations.

Certificates are issued by the office of the Director of Apprenticeship after the Apprentice has successfully completed his course work and his indenture period. Depending on whether the trade is designated under the Apprenticeship and Tradesmen's Qualification Acts, the apprentice becomes eligible for:

- (a) The Completion of Apprenticeship Certificate
- (b) The Certificate of Qualification
- (c) The Certificate of Proficiency

The Inter-Provincial Red Seal is placed on the Completion of Apprenticeship Certificate.

Another measuring instrument, and one the Employer of Apprentices uses, is the pay range scale. Through the years the scales shown in the table above have been approved by the Advisory Committees. Apprentices are **employed** persons and they earn as they learn.

Apprenticeship is a method, a way of learning and acquiring a body of skills. The training on the job and the education obtained at the Institute help provide the Apprentice with a background to not only meet the everyday demands of the job but to adjust to the changing patterns of employment.

# PRE-EMPLOYMENT COURSES

## COMMERCIAL SIGNWRITING

### SEVEN-MONTH COURSE

October 26, 1964 to May 21, 1965

Fees \$54.00 plus \$5.00 Registration Fee

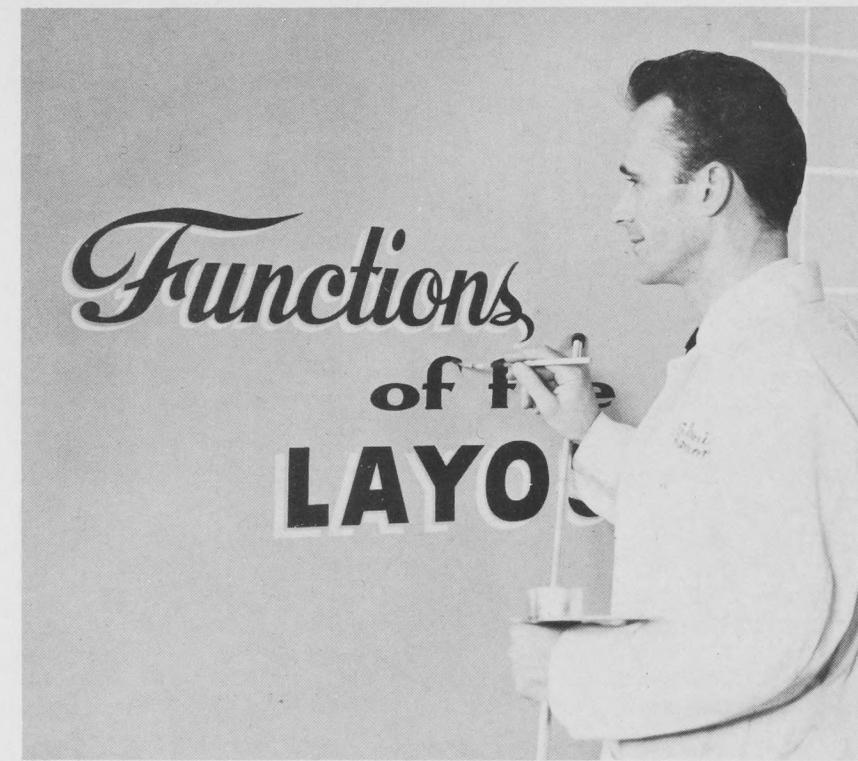
#### COURSE OF STUDY

	Hours
Theory	196
Shopwork	420
Shop Drawing	140
Related Subjects	84
<b>TOTAL</b>	<b>840</b>

Designed to assist talented young people who have the desire to enter this interesting occupation as a vocation. The course is planned specifically to develop the manual skills and theoretical knowledge of lettering, layout and perspective now required to obtain employment in the field of commercial signwriting.

With the growth of industry in the Province, career opportunities in advertising through the medium of lettering are rapidly expanding. Few business enterprises can function efficiently without the aid of skilled craftsmen, professionally trained in the art of display writing on notice boards, office doors, window glass and commercial vehicles. Well qualified personnel can expect to find rewarding and profitable employment with, among others, sign shops, department stores, public service organizations, electric sign companies and food and chain stores.

While the basic fundamentals of layout and design for bulletin and wall work and for silkscreen processing will be covered during



the course, the emphasis will be upon actual shopwork. This will include surface preparation, harmony for sign work, manipulation of quill and sable, etc. Many hours will be spent in supervised shop practice under practical conditions, designing and completing signs on wood and glass. The graduate student can feel well qualified to offer his services to a sign company as a competent craftsman.

Preference will be given to applicants who are at least seventeen years of age and who have completed grade X. Students, after discussion with their instructor, should expect to supply textbooks and instruments at an additional cost of about \$25.00.

# FACTORY WOODWORKING

## SEVEN-MONTH COURSE

October 26, 1964 to May 21, 1965

Fees \$54.00 plus Registration Fee \$5.00

### PROGRAM

	Hours
Woodworking Theory	168
Woodworking Shop	420
Shop Drawing	84
Wood Finishing	28
Mathematics	56
General Knowledge	28
Estimating & Costing	56
<b>TOTAL</b>	<b>840</b>

This course provides training for positions in any of the rapidly expanding woodworking industries.

The wood-products field is not limited to millwork plants, but also encompasses furniture factories, manufacturers of store-fixtures, shipping containers, boats, sporting goods, pre-fabricated home manufacturers, commercial display work and many related areas.

Opportunities for employment are, therefore, as numerous and varied as the types of wood products produced and there is plenty of room for young men to grow and prosper, individually and with progressive organizations.

The course consists of the "What" and the "Why" as well as the "How" of woodworking; and starts with a basic, well disciplined practical background in the structure of wood and its physical and mechanical properties. Stress is placed on the species and properties most important in the manufacture of today's wood products.



To ensure that the student not only gets the theoretical understanding and knowledge but also receives a thorough and well rounded training in actual application, about half of the attendance time is spent in shopwork. Three projects, chosen for their value as specific examples to illustrate procedures, are made or erected so that step by step development of knowledge and craftsmanship go hand in hand.

With Canada among the richest countries in wood resources, it is obvious that the demand for skilled woodworkers will remain high and is likely to increase in the years to come.

### Educational Prerequisites

The minimum acceptable education is Grade X. In cases where the applicant is mature and has had considerable experience with woodworking or closely related fields, exceptions will be made. In these cases an interview with the Registrar and Head of the Department is necessary.

### Tools and Textbooks

Students will be expected to purchase a minimum of tools and textbooks at an additional cost of approximately \$25.00.

# CONSTRUCTION

## SEVEN-MONTH COURSE

October 26, 1964 to May 21, 1965

Fees \$54.00 plus \$5.00 Registration Fee

### COURSE OF STUDY

	Hours
Bricklaying	192
Carpentry	192
Cement Finishing	36
Painting and Decorating	108
Plastering	108
Tilesetting	36
General Knowledge	28
Mathematics	56
Shop Drawing and Blueprint Reading	84
<b>TOTAL</b>	<b>840</b>

This course is designed to provide understanding of the tools, materials and methods currently in use by the building construction industry and to acquire the skills needed in using these materials. The organization and regulations relating to the building trades will also be taught.

This training provides the graduate with an overview of the work involved in several of the construction trades and will give him an advantage in finding employment as an apprentice in the trade of his choice.

To ensure that the student receives a thorough, practical training, approximately one-half of each week will be spent on shopwork. Projects, chosen for their value as specific examples to illustrate



construction procedures, are made or erected so that a step by step development of knowledge and craftsmanship go hand in hand.

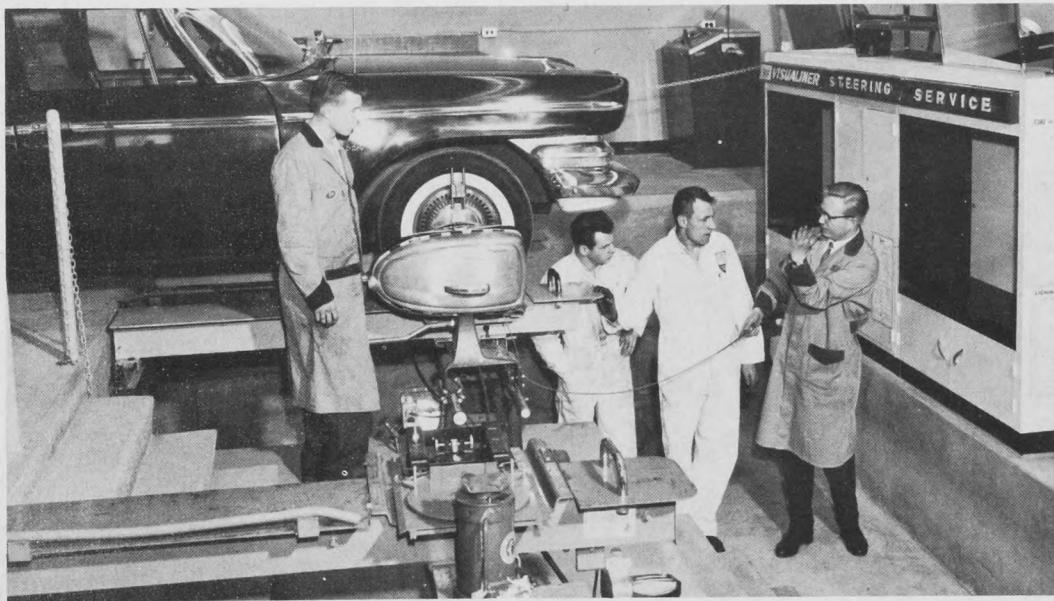
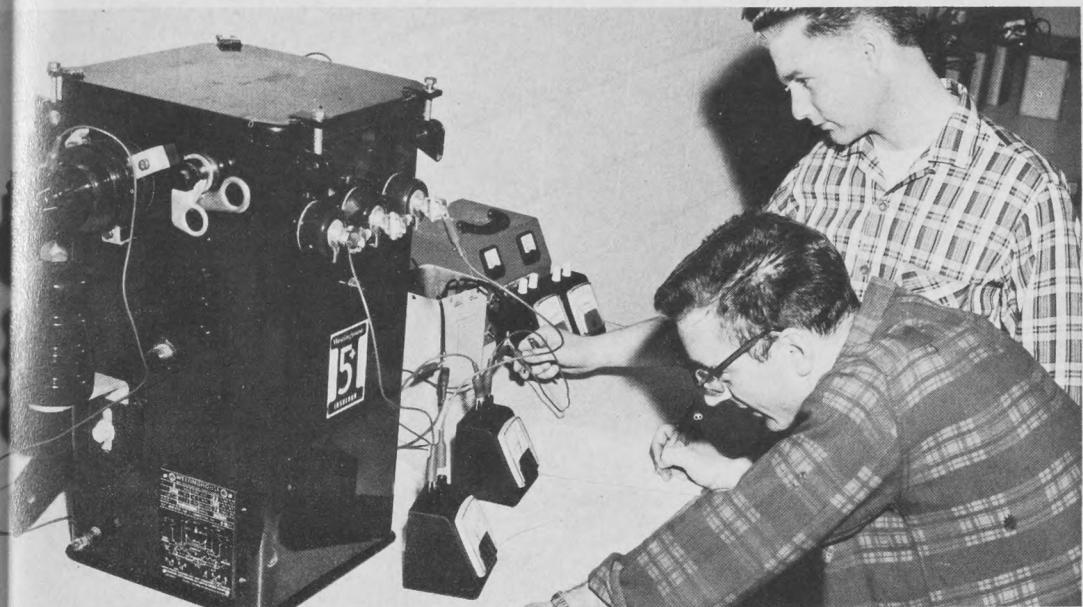
With the skills thus obtained, the chances for employment are not limited to the construction industry, but form a good basis for related occupations.

### Educational Prerequisites

The minimum acceptable education is Grade X. In cases where the applicant is mature and has had considerable experience with construction work, exceptions will be made. In these cases an interview with the Registrar and Head of the Department is necessary.

### Tools and Textbooks

Students will be expected to purchase a measuring tape, an architect's scale rule, set squares and a few textbooks. The sum of \$25.00 should be sufficient to cover the minimum requirements.



## KEY TO UNIT OUTLINE

AT.	Architectural	IP.	Industrial Production
B.	Business	IT.	Instrumentation
CHM.	Chemical Laboratory	INDREL.	Industrial Relations
CON.	Construction	MATH.	Mathematics
CT.	Civil	ML.	Medical Laboratory
DA.	Dental Assistant	MT.	Materials
DM.	Dental Mechanic	ORIENT.	Orientation
DN.	Dental Technician	OM.	Office Machines
DT.	Drafting	PHYS.	Physics
ENG.	English	PT.	Photography
ET.	Electronics	RA.	Refrigeration and Air Conditioning
FS.	Food Service	S.	Secretarial
GT.	Gas	V.	Sewing
HD.	Heavy Duty	XR.	X-Ray
IE.	Industrial Electrical		

The following Unit Outlines constitute complete descriptions of the various subjects covered in the courses offered at the Institute. They are arranged alphabetically and numerically. Please refer to course outlines following each course description for abbreviation and number.

# UNIT OUTLINES

AT. 101	<b>DRAWING AND SKETCHING</b>	(1-2)	AT. 224	<b>DESIGN IV</b>	(0-6)
	Technical and artistic sketching; basic techniques; scale and proportion; construction details; perspective and architectural presentation.			Problems in sketch and working drawing form; site and orientation design.	
AT. 111	<b>ARCHITECTURAL DRAFTING I</b>	(1-8)	AT. 231	<b>MECHANICAL EQUIPMENT</b>	(2-0)
	Lettering, applied geometry; theory of projection; dimensions and notes; presentation drawings; details of frame construction.			Introduction to the unit; heating; air conditioning; electrical equipment; acoustics.	
AT. 112	<b>ARCHITECTURAL DRAFTING II</b>	(2-9)	AT. 232	<b>SANITARY SERVICES</b>	(2-2)
	This quarter is devoted to a complete set of drawings for a small building.			The lecture portion of this unit will cover sanitation problems, water supply and distribution in buildings, sewer systems, codes and equipment. Laboratory work will involve design and layouts for small buildings.	
AT. 121	<b>DESIGN I</b>	(1-3)	AT. 233	<b>ELECTRICAL SERVICES</b>	(3-0)
	Fundamentals of design; line, area and value; color; texture; volume and space; related problems.			This course is intended to acquaint the student with the principles of electrical service and illumination of buildings.	
AT. 202	<b>ARCHITECTURAL DRAFTING I</b>	(1-3)	AT. 251	<b>ARCHITECTURAL PRACTICES</b>	
	A study of the production of architectural drawings including preliminary studies; presentation drawings; detailing and working drawings.			Nature and scope of professional competence and responsibility in practice. Office organization and procedure, visiting lecturers.	
AT. 203	<b>ARCHITECTURAL DRAFTING II</b>	(1-3)	B. 100	<b>RECORD KEEPING</b>	50 hours
	Elements of plumbing, heating and electrical systems; stair construction and design; schedules, title blocks and notes on architectural drawings; R.A.I.C. filing system.			Provides instruction in the keeping of records for buying, selling, handling cash and maintaining budgets. The seventy learning units commence by telling the student something about the purpose of record keeping and the manner in which records and reports organize information to tell a story. The student is introduced first of all to simple, everyday business records and is gradually led into the more complex records of mercantile and service businesses. Finally, double-entry bookkeeping is introduced and is continued through the bookkeeping cycle.	
AT. 204	<b>ARCHITECTURAL DRAFTING III</b>	(1-3)		Prerequisites: None	
	An introduction to principles of rendering and preparation of presentation drawings as practiced in architectural offices.		B. 101	<b>INTRODUCTION TO BUSINESS</b>	
AT. 213	<b>ARCHITECTURAL DRAFTING III</b>	(2-9)		A basic background course in the general fields of business, aimed at developing an awareness of the nature of business in the capitalistic system. Introduction to the field of ownership, organization, personnel, finance, marketing, managerial control, insurance, production, foreign trade and government regulations.	
	Review of first year work; working drawings and details for small wood construction building; survey theory and practice, including measurements of existing buildings; detailing of foundations; masonry and curtain walls; structural steel and reinforced concrete details.		B. 105	<b>INTRODUCTION TO BANKING</b>	
AT. 214	<b>ARCHITECTURAL DRAFTING IV</b>	(2-9)		The history of Banking. Establishment of original Chartered Banks and their evaluation as Canada developed Westward and Trade of Commerce increased. The purposes and functions of banks in our economy. The changing legislation and development of the Bank Act and the place of the Bank of Canada in our banking system and its effect on our economic system. Bank Organization and Responsibility from Head Office to Branch.	
	Organization of an architectural office; use of reference material; trade rules and building codes; one week of actual work in an Architect's office.		B. 111	<b>BOOKKEEPING</b>	50 hours
AT. 215	<b>ARCHITECTURAL DRAFTING V</b>	(2-9)		This is a beginning course in bookkeeping and is presented with the balance sheet approach. Extreme importance is given to the basic principles of double-entry bookkeeping to provide a good background for further study in the field of accounting. Attention is given to statements, accounts, ledgers, journals, banking procedures, purchase, sales, and general records.	
	Presentation techniques (drawings, photography, scale models); complete project of a small commercial building.			Prerequisite: None	
AT. 222	<b>DESIGN II</b>	(0-3)			
	Review of first year work; continuation in development of techniques; historical review; present design influences.				
AT. 223	<b>DESIGN III</b>	(0-3)			
	Influence of industrial design and sculpture; sketching, lining and shading.				

<b>B. 112</b>	<b>BOOKKEEPING</b>	<b>50 hours</b>	percentage with emphasis on speed, accuracy and short-cuts in computation. Simple and compound interest and bank discount, trade and cash discounts, list and net cost price, installment buying, mark-up, margins and retail price are covered in this course.
In this section of bookkeeping, the general journal, combination journal and the work sheet are presented together with adjusting and closing entries. A practice set is introduced to help the student understand the complete bookkeeping cycle. Prerequisite: B. 111			
<b>B. 113</b>	<b>BOOKKEEPING</b>	<b>50 hours</b>	
The study of depreciation of fixed assets and disposing of fixed assets introduces this phase of bookkeeping. Other aspects, such as bad debts, notes and interest, accrued expenses, types of business enterprises and budgets are also covered. Additional practice sets may be used. Prerequisite: B. 111 and B. 112			
<b>B. 115</b>	<b>ACCOUNTING</b>		
This is the beginning course in accounting and is presented with the balance sheet approach. Extreme importance is given to the basic principles of double-entry accounting to provide a good background for further study in the field of accounting. Attention is given to statements, closing entries, adjusting entries, merchandising and inventory, notes and acceptances, banking, controlling accounts, partnerships, and corporations.			
<b>B. 116</b>	<b>ACCOUNTING</b>		
Here the student advances to the applications of voucher systems, cash control and banking, receivables and investments, inventory accounting, fixed assets—definitions and classification, liabilities—long and short term and manufacturing operations—use of account numbers and expense controls.			
<b>B. 117</b>	<b>ACCOUNTING</b>		
This phase of the course will cover the introduction to cost accounting, including classification of material, labour and overhead. A study is made of the accounting principles and need of accounting data. Considerable time is spent on analysis of financial statements, statement of application of funds and consolidated statements. Included are departmental operations, installment sales, branches and intensive review of the full accounting cycle.			
<b>B. 121</b>	<b>BUSINESS ENGLISH</b>		
To introduce the student to the effective use of English in our modern business world. This course is designed to increase the student's vocabulary, spelling ability, usage of words and general grammar structure in oral and written communication. An introduction will be made to the proper form of a business memo including planning, writing and clarity of your message to the recipient.			
<b>B. 122</b>	<b>BUSINESS ENGLISH</b>		
Special emphasis is placed on business letter-writing. Various styles of letter forms will be studied and students will be required to type acceptable business letters including: inquiries, responses, orders, acknowledgments, remittances, public relations, application and personal letters, customer service, sales promotional letters of recommendation and collection will be studied. A study of the business reports will be included.			
<b>B. 131</b>	<b>BUSINESS MATHEMATICS</b>		
A study of basic mathematics as it relates to business operations. Basic operations such as addition, subtraction, multiplication, division, fractions, decimals and			
<b>B. 132</b>	<b>BUSINESS MATHEMATICS</b>		
Further study in compound interest, present value, annuities, depreciation, insurance, profit and loss, amortization, sinking funds, taxation, stocks and bonds, partnership, payroll, mortgages and an introduction to statistics are covered in this course.			
<b>B. 141</b>	<b>BUSINESS LAW</b>		
In the first term of Business Law, emphasis is placed not only upon principles and rules but also upon the purpose and logic of law. Fundamental legal aspects in common business transaction are studied including contracts, guarantee and suretyship, and agency. Questions at the end of the chapter along with cases are briefed and discussed.			
<b>B. 142</b>	<b>BUSINESS LAW</b>		
A continuation of the study of law as it relates to business affairs is presented in this second course in Business Law. The law of master and servant, negotiable instruments, banking and interest, and an introduction into insurance are considered.			
<b>B. 143</b>	<b>BUSINESS LAW</b>		
Principles and problems relating to the state of goods, mortgage, chattel mortgage, real property, leases, mechanic liens, partnership, companies and bankruptcy are investigated.			
<b>B. 144</b>	<b>SALESMANSHIP</b>		
A survey of the many aspects of selling, including characteristics of the customer, buying motives, and pre-approach, the approach, demonstrating, the merchandise, handling objections, closing the sale, etc. Sales demonstration by students can be very helpful.			
<b>B. 151</b>	<b>TYPEWRITING</b>	<b>50 hours</b>	
This is a beginning course in typing for those with little or no previous typing instruction. It covers the parts and construction of the more common makes of typewriters, learning of the keyboard, and the basic techniques of the touch system. Prerequisite: None			
<b>B. 152</b>	<b>TYPEWRITING</b>	<b>50 hours</b>	
A continuation of B. 151 with emphasis on techniques, speed, and accuracy. Prerequisite: B. 151			
<b>B. 153</b>	<b>TYPEWRITING</b>	<b>50 hours</b>	
In this course, emphasis is on speed and accuracy so as to produce acceptable work in the office. The student is introduced to many different forms used in business and learns how to properly complete these forms. Prerequisite: B. 152			

<b>B. 161</b>	<b>SHORTHAND</b>	50 hours	
A beginning course in either Pitman or Gregg for students with little or no background in shorthand. It is a study of simplified principles which will enable the student to take simple dictation and transcribe it in the early part of the course.			of modern trade unions. Expenditures and revenues of Governments, the nature of money, and how the operation of our banking system affects the money supply are covered.
Prerequisite: None			
<b>B. 162</b>	<b>SHORTHAND</b>	50 hours	
This course is a continuation of B. 161, dealing principally with special and abbreviated forms, punctuation and compound words in conjunction with writing and transcribing exercises aimed at increasing speed.			Attention is given to the national product, national income and business cycle. The role of Government and its stabilization techniques. International trade, balance of payments, international economic co-operation, and problems of economic growth are discussed.
Prerequisite: B. 161			
<b>B. 163</b>	<b>SHORTHAND</b>	50 hours	
A continuation of basic shorthand principles but with emphasis on speed. It includes vocabulary, phrase building, and word building principles. Practice should develop the student's speed to levels acceptable by business.			Theory presentation of duties and responsibilities of clerical positions in Current Account and Savings Departments, Liability or Discount Department, Collection Department, Foreign Exchange Department, Clearing Department and Accountants Department with practical application in opening accounts, completing cheques and deposits, writing drafts, figuring due dates, handling v/s and Sterling cheques, clearing cheque lists and completing applications for Money Orders, Drafts and Travellers Cheques, culminating in operation of a sample Branch. Instruction supplemented by Canadian Bankers Association Training Films.
Prerequisite: B. 162			
<b>B. 172, 173, 174</b>	<b>BRIEFHAND</b>	150 hours	
Briefhand is exactly what its name implies: a logical, practical, easy-to-use, easy-to-learn system for abbreviating longhand. It is not a symbol shorthand. In fact it contains absolutely no symbols foreign to the alphabet itself. One, two or three terms are offered according to the individual student's need and desire.			
<b>B. 171</b>	<b>CREDIT AND COLLECTIONS</b>		
The general nature and functions of credit, credit instruments, operation of the credit department, sources of credit information, acceptance of credit risk, establishments of credit limits and collections is covered. The importance of a sound credit policy in relation to a successful business is emphasized.			
<b>B. 175, B. 176, B. 177</b>	<b>BANK BOOKKEEPING</b>		
Basic bookkeeping covering accounting cycle with emphasis on application to bank cash book and bank records in double entry. Problems and practice sets. System covering general journal, special journals, ledgers to revenues and expense statement and balance sheets. Continuation to accruals, inventory systems, work sheets, partnership accounting and liquidation, corporation and investment accounting, departmentalization and financial statement analysis.			
<b>B. 178</b>	<b>BANK MACHINES</b>		
Rotation method used for direct application instruction in use of addressograph in setting up ledger accounts, posting of current accounts and savings and general ledger on Sensimatic. Posting machines, use of cheque protector and handling of deposits and clearing on fully automatic cheque sorter, printer and proof machine. Aim is to provide sufficient practice for full understanding of machine operation and development of operational skill.			
<b>B. 181</b>	<b>ECONOMICS</b>		
Economics, taught in the first term, is a study of various forms of business establishments, theory of price and its application. Analysis of firm and industry under perfect and imperfect competition. Emphasis is placed on economic terminology.			
<b>B. 182</b>	<b>ECONOMICS</b>		
In this phase of economics the course examines the distribution of income. Brief history of trade unions in Great Britain, U.S., Canada, and the function			
	<b>ECONOMICS</b>		
	<b>B. 183</b>		
	<b>ECONOMICS</b>		
	<b>B. 191, B. 192, B. 193</b>		
	<b>BANKING LABORATORY</b>		
	<b>B. 195</b>		
	<b>PUBLIC RELATIONS</b>		
	<b>BDP. 101</b>	<b>INTRODUCTION TO BUSINESS I</b>	50 hours
	Canadian Economic System, Forms of Business, Structure, Management, Banking and Finance, Risks and Insurance, Personnel and Labour, Production, Marketing, Retailing, Sales Transportation, Foreign Trade, Law, Government.		
	<b>BDP. 111</b>	<b>ACCOUNTING FOR DATA PROCESSING I</b>	50 hours
	Fundamentals of Bookkeeping, the Balance Sheet, Purchasing Routine, Sales Routine, Cash Records and Control.		
	<b>BDP. 112</b>	<b>ACCOUNTING FOR DATA PROCESSING II</b>	50 hours
	Accounting Routine, Outline Periodic Duties, Introduce Payroll Accounting, Negotiable Instruments, Adjustments for Preparation of Financial Statements, Inventories and Fixed Assets, Financial Statements, Types of Business Organization.		
	<b>BDP. 113</b>	<b>ACCOUNTING FOR DATA PROCESSING III</b>	50 hours
	Manufacturing Accounts, Departmentalization, Agencies and Branches, Analysis of Financial Statements, Costing.		
	<b>BDP. 131</b>	<b>BUSINESS MATHEMATICS I</b>	50 hours
	Review of Skills, Fractions, Decimal Fractions, Percentage and Discount, Fundamentals of Algebra, Simple Interest and Discount, Compound Interest and Discount, Annuities, Bonds, Amortization, Sinking Fund, Life Insurance, Graphs.		

**BDP. 181****DATA PROCESSING I**

150 hours

Introduction, Basic Principles, General Functions, Basic Wiring, Simple Practice Problems.  
Prerequisite: None.

**BDP. 182****DATA PROCESSING II**

150 hours

Advanced Wiring, Procedure Writing and Interpretation, Flow Charting, Card and Form Design, Coding, Applications and Problems of a more advanced nature.  
Prerequisite: B. 181

**BDP. 183****DATA PROCESSING III**

150 hours

Problem Analysis, Introduction to Systems, Control, Scheduling, Job Timing and Costing, Case Studies and Practical Work, Advanced Equipment and an Introduction to Computers.

**BDP. 185****FUNDAMENTALS OF PSYCHOLOGY**

50 hours

**RELATED SUBJECTS —**

This course is designed to assist the student in developing a sound basis for his relationship with other people. Important to his progress in the business world are the following study topics: human motivation, influencing other people, emotional control, an understanding of intelligence, personality development, social relations, perception, learning, thought and imagination, problem and solution process, efficiency and personal happiness.

**BDP. 195****ORAL COMMUNICATIONS**

50 hours

A study of the importance and use of effective Oral Communication in the business and social communities. Participation in platform speaking, group discussions, personnel interviews, etc., will be highlighted with emphasis placed on personal appearance, preparation, voice expression, use of gestures, development of interest, confident appearance, and worthwhile content.  
Prerequisite: None

**B. 211****INTERMEDIATE ACCOUNTING**

A review of the principles of accounting but a more thorough study of financial statements and the theory of accounting. Includes preparation of retained earnings statement, accounting for capital stock, surplus and dividends, stockholders' equity, concluding with general accepted accounting principles.

**B. 212****INTERMEDIATE ACCOUNTING**

Advanced accounting for receivables, inventories, investments, tangible and intangible assets, liabilities and reserves, interpretation of financial statements, concluding with an analysis of working capital. Class discussions will be prevalent to increase individual fluency with accounting terminology and classification of statements.

**B. 213****INTERMEDIATE ACCOUNTING**

Managerial view in accounting, commencing with the analysis of operations to application of funds and income tax, concluding with business reorganizations. Various statements will be compared and analysed.

**DATA**—The major portion of this course will be on integrated data processing. Advantages and disadvantages of data processing including limitations. Practical application in data processing will be done.

**B. 215****INSURANCE**

Basic risk analysis; introduction to fire, casualty, life and health coverages; business and personal insurance needs; company organization and industry practices; the liability peril; automobile insurance; claims procedure; standard forms are presented and discussed.

**B. 221****OFFICE PRACTICE I**

50 hours

Attitude, Work Habits, Personality and Character Traits, Dress, Office Organization, Filing.

**B. 222****OFFICE PRACTICE II**

50 hours

Mailing Procedures, Communication, Record Keeping, Sources of Information, Public and Internal Relations.

**B. 223****OFFICE MACHINES**

50 hours

Introduction to the use of Office Machines in operating an efficient business. The use of bookkeeping machines, duplicating equipment and some exercises in dictation and transcription make up this course.

**B. 224****OFFICE MACHINES**

50 hours

This term emphasizes mathematical machines found in larger offices such as the full-keyboard adding-listing machine and the key-driven calculator. During the two terms students will be rotated to receive practice on the ten-key adding machines, full-keyboard adding listing machines, key-driven calculator and posting machines.

**B. 225****SALES ADMINISTRATION**

Function of sales management in marketing process; his administrative duties, analysis of market, policy function, recruiting, selecting, training, supervising, and evaluating salesmen.

**B. 226****OFFICE PRACTICE**

50 hours

Emphasis in this term is on duties of the secretary in meeting the public as receptionist, cashiering, preparing credit instruments, and sales office operations. The importance of personality and public relations is emphasised.

**B. 227****OFFICE MANAGEMENT**

50 hours

Introduces office methods for dealing with communications, correspondence, reports and filing. Work simplification and method study procedures are outlined together with office organization and personnel responsibilities.

**B. 231****BUSINESS ADMINISTRATION**

A study of problems that relate to the organization and operation of a business. Such aspects of business as location, layout, purchasing, stock control and sales are discussed to give a student insight into the problems of business in general.

**B. 232****BUSINESS ADMINISTRATION**

Business organization and management are studied as they apply to the personnel functions of recruitment, selection, placement, induction, and training. Attention is also given to employee relationship and morale.

**B. 233**

### **BUSINESS ADMINISTRATION**

The major concern of this course is to deal with the problems of marketing functions and institutions, pricing policies and practices, unfair methods of competition and governmental regulations.

**B. 235**

### **PAYROLL ACCOUNTING**

Payroll accounting is a detailed study of all phases of records dealing with the employee from the initial hiring to termination. This course will cover payroll recording including simple multiple entries, one-write system with needle sort card distribution to punched card installations. A study is made of the labour acts, unemployment insurance act, workmens' compensation act and various employee benefits including medical, hospital, pension, etc. Advantages and disadvantages of incentive payroll will be discussed.

**B. 241**

### **RETAILING**

This course is designed to introduce the student to the vast field of retail merchandising. It covers such areas as customer buying habits, what, where, and how to buy, control of stock, inventory, customer service, etc. It is of basic importance to anyone contemplating entering the retail field of merchandising and selling.

**B. 242**

### **RETAILING**

In this course attention is given to the more advanced problems of merchandising, such as inventory methods of Merchandise Accounting, Credit and Collection, and major managerial responsibilities.

**B. 245**

### **PERSONNEL**

A general survey of objectives, functions and practices of personnel administration which contribute to the successful business operation. Job analysis, job evaluation, evaluation of employees and other matters pertaining to employee-management relations.

**B. 251**

### **MARKETING PRINCIPLES**

A description and analysis of marketing process, scope of marketing channels of distribution and marketing policies.

**B. 252**

### **MARKETING**

Promotional programs, budgeting, transportation, sources of information, marketing programs, introduction to the case method of study.

**B. 261**

### **BUSINESS STATISTICS**

The statistical analysis of business and economic data. Emphasis is placed in assembling data, charts, dispersion, probability, distribution, sampling, control, and analysis of business change. Effective use of statistical data is developed through realistic problems.

**B. 262**

### **ADVERTISING**

A general study of the importance and use of advertising in business. Buying motives, stimulation of demand and preparation of copy. Other topics include advertising production, types of media and its purposes.

**B. 263**

### **ADVERTISING**

Continuation of B. 161. Study of media selection, campaign planning, evaluation of results and advertising appropriation. Class project provides practical application.

**B. 265**

### **BUSINESS FINANCE**

A survey of the principles, the functions, the practice, the procedures, the institutions and the problems of financing a business, such as acquisition of Capital, management of income, etc.

**B. 275**

This is a study of the principles and practices of business purchasing, including organization of the purchasing department and its relationship to other departments; policies and procedures on negotiation with vendors; transportation, determination of proper quality, quantity, source and prices. Selected case studies will be examined and evaluated.

**B. 281**

### **AUDITING**

The student is introduced to auditing with an explanation of the need for an independent audit. Means of ensuring the reliability of an audit, professional ethics, professional responsibilities, legal liabilities and approach. Preparation for the audit and an invalid audit.

**B. 282**

### **AUDITING**

Introduction to internal checking and audit procedure for accounts receivable and payable, purchases, cash transactions and revenue transactions. The verification and valuation of assets including the financial statements. A short study will be made of business investigations including practical audit work.

**B. 285**

### **INCOME TAX**

Accounting for the determination of taxable income and interpretation of the income tax act. The study will include individual income tax computation, arm's length, depreciation, income and expense allowance. Case studies will be used to promote group discussions.

**B. 291**

### **COST ACCOUNTING**

Introduction to cost accounting, defining, the relationship of cost accounting to general accounting, cost flow, cost elements, cost classification and cost system. The adaption of the voucher system to the factory ledger and purchasing. Various methods of material control will be evaluated.

**B. 292**

### **COST ACCOUNTING**

A study of labour control and distribution including manufacturing expenses applied as compared to actual. Complete application of a job costing system will be summarized.

**B. 293**

### **COST ACCOUNTING**

Conclusion of job costing including various applications and the significance of accurate job costing data. A special adaption of costing of by-products will be made. Process costing will be introduced, concluding the course with the flexible budgets.

B. 295

### INVENTORY CONTROL

The student will study the various types of inventory control including perpetual and periodic inventory, pricing by lifo, fifo, average method and selling price. Methods of control will include ledger, cardex, machine card, punched card and punched tape. A brief study will be made of the high and low points including minimum and maximum quantity orders.

CHM. 101

### GENERAL INORGANIC CHEMISTRY

(3-3)

Brief review of fundamental concepts: periodic system; structure of matter. Chemical nomenclature, formulas and equations. Study of properties and reactions of some common elements: Industrial application on preparation of aluminum; qualitative analysis; titration—acid, base; activity series; corrosion.

CHM. 102

### PHYSICAL AND ANALYTICAL CHEMISTRY

(3-3)

Calculations involved in analysis; standard solutions; solubility; dissociation; precipitation; redox titration; gas laws; triple point. Fundamental concepts related to the analytical instruments; characteristics of liquids: adsorption, emulsion and surface tension. Lab. work includes volumetric titration; pH meter; spectrophotometer; combustion; gas analysis with Tutweiler, Hempel and Orsat.

CHM. 103

### ORGANIC CHEMISTRY

(3-3)

Introduction to the structure and reactivity of organic compounds; nomenclature; isomerism of carbon bonds; study of common types of aliphatic compounds: hydrocarbons, alcohols, ethers, aldehydes and ketones. Lab work includes special techniques of organic chemistry: boiling point, melting point, distillation and Soxhlet extraction. Qualitative detection of organic groups; gas chromatography; molecular weight determination.

CHM. 104

### QUANTITATIVE ANALYTICAL CHEMISTRY

(3-3)

Calculations involved in analysis, standard solutions, precipitation, redox titration. Fundamental concepts related to quantitative analytical instruments. Lab work includes volumetric titration, gravimetric analysis, water analysis.

CHM. 105

### PHYSICAL CHEMISTRY

(3-3)

Solubility, dissociation, gas laws, phase diagram, characteristics of liquids, absorption, emulsion, surface tension. Lab work includes pH meter, combustion, spectrophotometer, gas analysis with Tutweiler, Hempel and Orsat.

CHM. 111

### PHOTOGRAPHIC CHEMISTRY I

(3-3)

Brief review of fundamental concepts, periodic system; structure of matter. Chemical nomenclature, formulas and equation. Study of properties and reactions of common elements with reference to the periodic table. Introduction to colloid chemistry. Preparation and properties of gelatin. Principles of emulsion preparation. Lab work includes basic techniques in analytical chemistry, qualitative analysis, titration—acid base; use of analytical balance.

CHM. 112

### PHOTOGRAPHIC CHEMISTRY II

(2-1)

Basic composition of plates and films for black and white photography; the photographic process; chemical aspects of exposing, developing and making the print; basic principles of colour photography; sensitive dyes. Lab work includes experiments on solubility; dissociation; colloidal phenomena; emulsions, microscopy.

CHM. 121

### GENERAL CHEMISTRY

(2-0)

Review of fundamental concepts in chemical theory, including the periodic chart, structure of matter, typical chemical reactions and equations; introduction to organic chemistry; properties and formula of typical organic compounds related to biochemistry.

CHM. 122

### GENERAL CHEMISTRY

(3-2)

A survey of the basic principles of inorganic chemistry, organic chemistry, and biochemistry. Lab work includes selected methods of separation, purification and analysis of various elements and compounds.

CHM. 131

### INORGANIC QUALITATIVE CHEMISTRY

(3-9)

General chemistry, with review of chemical nomenclature and periodic chart of the elements; compositions and reactions of basic inorganic non-metallic compounds, with special emphasis on analytical chemistry. Lab work includes manipulation of standard apparatus common to most chemical laboratories; basic techniques in analytical chemistry with introduction to qualitative analysis.

CHM. 132

### INORGANIC QUANTITATIVE CHEMISTRY

(3-9)

Composition and reaction of inorganic metal compounds; minerals and ores: crystallization and isomorphy; calculations involved in analysis and chemical equilibria. Lab work includes tools for quantitative analysis; the analytical balance operation; methods of volumetric analysis: neutralization, oxidation and reduction; preparation of standard solutions; gravimetric analysis.

CHM. 133

### INDUSTRIAL INORGANIC CHEMISTRY

(3-8)

Industrial importance of basic inorganic chemistry with reference to production and control; plant process; industrial wastes; corrosion; steel and alloys. Lab work includes water analysis; total hardness; gas analysis; inorganic preparations with high vacuum and non-aqueous solvents.

CHM. 141

### OIL CHEMISTRY I

(1-2)

Petroleum geology, with geological time scale; theory of the origin of oil; the occurrence of petroleum deposits; types of petroleum reservoirs, the chemical and physical nature of oil; production techniques; exploration; drilling; properties of natural gas. Lab work includes tests on motor and aviation gasolines, based on ASTM standards.

CHM. 142

### OIL CHEMISTRY II

(1-2)

Production and refining of petroleum; synthetic production of gasoline based on natural gas, coal, etc. Lab work includes tests on kerosenes, diesel fuels and fuel oils, based on ASTM standards.

CHM. 143

### OIL CHEMISTRY III

(1-2)

Understanding of the chemical and physical properties of petroleum and its products; specifications; additives. Lab work includes tests related to engine lubricating oils, greases and bituminous materials, based on ASTM standards.

CHM. 151

### BASIC ORGANIC CHEMISTRY I

(3-0)

The structure and reactivity of organic compounds; nomenclature; industrial importance; isomerism of carbon bonds. Aliphatic hydrocarbons: paraffins, olefines and acetylenes.

CHM. 152

**BASIC ORGANIC CHEMISTRY II**

(3-3)

Study of common types of aliphatic organic compounds: haloalkanes, alcohols, ethers, acids and fatty oils, esters, aldehydes and ketones. Lab work includes special techniques of organic chemistry: boiling point; melting point; different types of distillation; crystallization; extraction with organic solvents; drying agents; preparation and purification of basic organic compounds.

CHM. 201

**GENERAL ORGANIC CHEMISTRY**

(3-3)

Introduction to the structure and reactivity of organic compounds; nomenclature; study of common types of organic compounds. Lab work includes selected methods used in organic chemistry; extraction, distillation, melting point, molecular weight determination; qualitative analysis.

CHM. 204

**INDUSTRIAL ORGANIC CHEMISTRY**

(3-3)

Purification of natural gas; production of most important basic organic chemicals in industry: rubber, plastics and petroleum products; study of aromatic compounds, benzene series and derivatives. Lab work includes testing of industrial organic compounds, based on ASTM standards: viscosity, vapor pressure, flash point, neutralization, saponization, etc.

CHM. 205

**STOICHIOMETRY**

(3-3)

Chemical calculations concerning molecular weights, the percentage composition, weight relations from chemical equations, equivalent weight concepts, chemical equilibrium and solubility product. Lab work includes reaction of solutions; ionic equilibrium; measurement of gases.

CHM. 206

**INDUSTRIAL STOICHIOMETRY**

(3-0)

Statistics and quality control; thermochemistry; thermodynamics; calculations concerning industrial processes.

CHM. 207

**INORGANIC CHEMISTRY**

(4-0)

Brief review of periodic system, atomic structure, mass defect, atomic energy and radioactivity; stoichiometry of industrial applications on chemical processes; study of the typical inorganic reactions on the element families: inert gases, hydrogen, halogenes, alkali, sulfur, earth-alkali, nitrogen, etc.; basic information on electrolysis; metal chemistry related to industrial production.

CHM. 208

**ORGANIC CHEMISTRY**

(2-0)

Introduction to the structure and reactivity of organic compounds. Study of common aliphatic and aromatic groups.

CHM. 244

**FUELS AND LUBRICANTS**

(3-3)

The chemical and physical nature of petroleum and its products, including: refinery operations and synthetic development; study on specifications of gasolines, diesel fuels, motor oils, greases and additives. Lab work includes tests, based on ASTM standards, of viscosity, flash point, vapor pressure, carbon residue, acid and base numbers, etc.

CHM. 253

**AROMATIC ORGANIC CHEMISTRY**

(2-9)

Research (1-7)

Study of aromatic compounds; aromatic hydrocarbons; benzene series; halogen, sulfonic and nitro derivatives; alcohols, phenols, ethers, acids, aldehydes and

ketones. Lab work includes preparation of organic compounds; qualitative detection of elements and groups in organic compounds; testing of industrial organic chemicals.

CHM. 254

**ADVANCED ORGANIC CHEMISTRY**

(2-7)

Research (1-7)

Reaction of organic compounds in natural products; carbohydrates — sugar, starches, cellulose, terpenes, rubber, plastics; polymerisation. Lab work includes preparation and purification of organic compounds, with emphasis on the typical basic organic reactions, such as substitution, etc.; preparation of dyes, plastics and synthetic polymers having important industrial significance.

CHM. 255

**INDUSTRIAL ORGANIC CHEMISTRY**

(2-8)

Research (2-7)

Brief review of medicinals, reaction and synthesis; production of the most important basic organic chemicals in industry. Lab work includes preparation of synthetic drugs of common interest to the general public, such as aspirin, sulfanilamide, phenacetin, DDT, etc.

CHM. 261

**INSTRUMENTAL ANALYSIS I**

(2-9)

Research (2-6)

Theory and fundamental laws related to analytical instruments; description of colorimetry; fluorescence methods; spectrophotometry (ultra-violet, visible, infrared). Lab work includes manipulation and practical analysis involving different types of colorimeters and spectrophotometers; microscopy (study of characteristic crystals).

CHM. 262

**INSTRUMENTAL ANALYSIS II**

(2-9)

Research (2-7)

Methods of analysis: spectrography (emission, Raman); flamephotometry; x-ray methods; refractometry; polarimetry; gas chromatography. Lab work includes determination of the refractive indices of various liquids; sugar rotation and inversion; chromatography of hydrocarbons; quantitative examinations on minerals, steel and technical products using spectrophotometer with flame attachment.

CHM. 263

**INSTRUMENTAL ANALYSIS III**

(2-9)

Research (0-9)

The principles of electromotive force measurements; electrodeposition; potentiometry. Lab work includes combustion procedures to determine carbon content in steel and organic compounds; centrifuge; pH meter; potentiometric titrations; electroanalysis for determination of metals in solutions.

CHM. 271

**STOICHIOMETRY I**

(2-0)

Chemical calculation concerning molecular weights and percentage composition, mole and weight relations from chemical equations; measurement of gases; equivalent weight concepts, reaction of solutions.

CHM. 272

**STOICHIOMETRY II**

(2-0)

Chemical equilibrium, solubility product and precipitation; electrochemistry related to basic electrical law (Ohm, Faraday, etc.) calculations on isotopes; atomic weight scales, half life time.

CHM. 273

**STOICHIOMETRY**

(1-0)

Chemical calculations related to analytical chemistry and instrumental analysis; thermochemistry, electrochemistry, nuclear chemistry.

CHM. 275

**CHEMICAL STATISTICS I**

(1-0)

Introduction to statistics. The normal distribution. Significance tests:—of means, "t" test; of variabilities, "F" test; of expected against observed results,  $\chi^2$  test.

CHM. 276

**CHEMICAL STATISTICS II**

(1-0)

Correlation and regression. Quality control with interpretation of the quality control chart.

CHM. 277

**CHEMICAL STATISTICS I & II**

(2-0)

Introduction to statistics. The normal distribution. Significance tests:—of means, "t" test; of variabilities, "F" test; of expected against observed results,  $\chi^2$  test, Correlation and regression. Analysis of variance and experimental design.

CHM. 281

**PHYSICAL CHEMISTRY I**

(1-2)

The gas laws; molecular structure; studies in thermodynamics and thermochemistry; characteristics of liquids; surface phenomena; absorption; emulsions. Lab work includes molecular weight determinations; density; viscosity; solubility; surface tension.

CHM. 282

**PHYSICAL CHEMISTRY II**

(1-2)

Colloids; kinetic behaviour; osmotic pressure; sedimentation; homogenous and heterogenous equilibria; ionic conductance. Lab work includes dissociation; colloidal phenomena; exothermal reactions; transport number and conductivity, hydrolysis.

CHM. 283

**PHYSICAL CHEMISTRY III**

(1-2)

Phase diagrams; catalysis; radioactivity; nuclear structure; photochemistry. Lab work includes experiments to complete the understanding of the above headings.

CHM. 291

**GLASS BLOWING**

(0-3)

Lab work includes advanced course in glass blowing techniques to make and repair common chemical glass instruments as well as specialized apparatus.

Con. 101

**MATERIALS OF CONSTRUCTION I**

(3-0)

This course will provide the student with basic information concerning the commonly used building materials, and the utilization of these materials in specific products used in building construction. The materials studied include lime, gypsum, cement, concrete, wood, wood products, brick, clay, tile, concrete blocks, cast stone, natural stone, etc.

Con. 102

**MATERIALS OF CONSTRUCTION II**

(0-3)

This course will familiarize the student with the practical applications of the materials studied in Con. 101; emphasis to be placed on the advantages and limitations of each material. Instruction by examination of materials and models, demonstrations by trade instructors, shop projects and laboratory testing.

Con. 104

**MATERIALS OF CONSTRUCTION**

(3-3)

This course, a combination of Con. 101 and Con. 102, will provide the student with basic information concerning the commonly used building materials, and

the utilization of these materials in specific products used in building construction. The materials studied include lime, gypsum, cement, concrete, wood, wood products, brick, clay tile, concrete blocks, cast stone, natural stone, etc. Emphasis to be placed on the advantages and limitations of each material. Instruction by lecture, examination of materials and models, demonstrations by trade instructors, shop projects and laboratory testing.

Con. 105

**CONSTRUCTION TECHNIQUES**

(0-3)

Materials of frame, masonry, concrete and steel structures. Shop projects will emphasize concrete formwork; placing of steel; concrete mixing, pouring, testing and finishing.

Con. 121

**MATERIALS AND METHODS I**

(2-2)

Construction materials and methods to be studied in detail under the following headings: The use, care and maintenance of hand and power tools; woods and lumber; machining characteristics of lumber; plywoods; building boards; building papers and felts; roofing materials; house framing sections. Instruction by lecture, examination of materials and shop projects.

Con. 122

**MATERIALS AND METHODS II**

(2-2)

Construction materials and methods to be studied in detail under the following headings: formwork; millwork; doors and windows; cabinet work; glass and glazing; plastic and plastic laminates; adhesives; steel, metals and builders' hardware; paint and paint materials. Instruction by lecturer, examination of materials and models, field trips, shop projects and laboratory testing.

Con. 203

**CONSTRUCTION METHODS**

(2-0)

Study of good construction practices for houses, buildings and highways. Comparisons are to be made between various building materials and their proper usage. Study will also include winter construction practices, project scheduling and the employment of construction equipment of all types.

Con. 211

**ESTIMATING I**

(2-3)

This course is designed to acquaint the student with the everyday work of the building contractor's estimator. The following topics will be covered: techniques of estimating; quantity surveying; excavating; concrete foundations; concrete floors and roofs; masonry work; rough carpentry; finish carpentry; painting trades. All students will be required to submit a complete estimate on an industrial type building.

Con. 212

**ESTIMATING II**

(2-2)

Estimating of construction costs shall be studied under the following topics: floor area; volumetric and surface area methods of quick estimate; proportionate cost allowances for structural, electrical and mechanical systems; labor and location cost factors; cost comparison of materials; maintenance factors; fire resistance factors.

Con. 223

**MATERIALS AND METHODS III**

(2-2)

Construction materials and methods to be studied extensively under the following headings: sand; lime; cement; cement mortars; bricks; tiles; concrete blocks; stonework; masonry construction; gypsum products; plaster; terrazzo; marble; mosaic; industrial glass; industrial plastics and films; miscellaneous metal products. Instruction by lecture, examination of materials and models, field trips, shop projects and laboratory testing.

**CT. 101 INTRODUCTION TO ENGINEERING WORKS (0-1)**

A presentation of the history of engineering; recent developments in all kinds of engineering works, such as structures, highways, airports, canals, and earth-works; utilization of materials of construction, such as reinforced concrete, structural steel, wood frame, precast and prestressed concrete.

**CT. 111 STATICS I (3-0)**

This course is designed to give the students basic understanding of the force system. The study will include components; resultants; moments; equilibrium; center of gravity; moment of inertia; section modulus; fluid statics; friction. Review of applicable mathematics will also be presented.

**CT. 112 STATICS II (2-3)**

This course is a continuation of CT. 111. Basically, it is the application of statics to the solution of all kinds of engineering problems. The following topics will be presented: Analysis of statically determinate trusses; beams, moments and shears; types of loads; movable loading; simple influence lines. Application of statics to a solution of engineering problems will be demonstrated in the laboratory. Models will be used extensively for demonstration; other teaching aids will also be employed.

**CT. 121 SURVEYING (3-0)**

Theory and practice of surveying including transit and tape surveying; differential and profile levelling; care and adjustment of instruments; symptoms and correction of maladjusted instruments; layouts of structures from site plan; sewer and water profiles; practical problems of computation of areas; volumes of excavation.

**CT. 122 SURVEY FIELD WORK (0-3)**

This course is mainly field application of the principles taught in CT. 121. Use of plane table; curves; triangulation; horizontal and vertical angles; principles of field layouts for all kinds of engineering works.

**CT. 123 SURVEYING (1-3)**

Methods of surveying; how to record, interpret and apply field data; topographic surveys; sub-surface contour mapping; care and use of surveyor's tape, engineer's transit and level; determination of distances and elevations; traverse and cross section surveys.

**CT. 131 CONCRETE (2-2)**

This course will deal with the composition and properties of concrete. The topics will include: cement; aggregates; water; properties of fresh concrete; proportioning of concrete mixes; placing and curing; forms for concrete; strength; permeability; durability; creep; inspection.

**CT. 141 STRENGTH OF MATERIALS I (3-0)**

The course covers the principles involved in the analysis of stresses which occur within bodies subjected to various types of loads, such as static, impact, varying, and dynamic. Analysis of these stresses are made as they apply to ties, columns, riveted and welded connections, beams, struts, arches and simple frames.

**CT. 151 SOIL MECHANICS I (2-3)**

Physical and mechanical properties of soils; field sub-surface investigations; field and laboratory identification and testing. Theories of soil mechanics; classification; water content; consolidation; shearing strength; compaction; permeability.

**CT. 202****SEMINAR****(0-1)**

This course is designed to give the students the opportunity for discussion of their future work. Speakers from industry, consulting practice and government will discuss various technical topics. The student participation in discussion and questioning will be stressed.

**CT. 203****SPECIFICATIONS AND CONTRACTS****(1-2)**

This course is intended to familiarize the student with the specifications for various engineering projects. Study will concentrate on standard specification clauses; relation of plans to specifications and contracts; format; supplemental documents; revisions addenda; contract documents. Students will be required to write a complete set of specifications for an engineering project.

**CT. 213****DYNAMICS****(2-0)**

This course is designed to give the student basic understanding of dynamics. The study will include kinematics of particles; geometry of motion; kinematics of rigid bodies; angular velocity and angular accelerations; kinetics (the laws of force and motion); work, energy and power; impulse and momentum; mechanical vibrations.

**CT. 242****STRENGTH OF MATERIALS II****(1-2)**

This course is a continuation of CT. 141. The topics will include elastic deformation of beams, columns and trusses. Practical problems of stress analysis will be done in the laboratory. The students will have the opportunity to observe the behaviour of materials under simple tests.

**CT. 243****STRUCTURAL ANALYSIS I****(2-0)**

Review of shear and bending moment diagrams; analysis of three hinged arches; statically determinate rigid frames; stresses in trusses; influence lines; statically determinate beams; trusses; arches.

**CT. 244****STRUCTURAL ANALYSIS II****(1-2)**

This course covers the analysis of indeterminate beam and frames by moment distribution and column analogy.

**CT. 252****SOIL MECHANICS II****(0-3)**

This is a continuation of CT. 151, and is basically a laboratory course. The following topics will be covered: field sub-surface investigations; permeability; moisture content; unconfined compressive test; consolidation test; permeability test; compaction tests and control. In general the course will cover theory and practice of soil testing.

**CT. 253****FOUNDATIONS****(1-3)**

This course will cover practical applications of the principles of the soil mechanics to design of foundations for structures and bridges; retaining walls, pre-cast and cast-in-place piles; special earth structures. Laboratory work in soil testing is also included.

**CT. 254****ASPHALT AND SOIL CEMENT****(0-3)**

The purpose of this course is to provide the student with the basic information of testing and inspection of asphalt mixes, soil cement stabilization, sub-bases, etc., as used in highways and slabs on grade construction.

**CT. 261**

**STRUCTURAL DESIGN IN STEEL I**

**(2-2)**

The course will cover the fundamental principles underlying design in structural steel. The study will include type of structures and structural framing; beams and girders; tension and compression members; connections—riveted, welded and bolted; trusses; frames.

**CT. 262**

**STRUCTURAL DESIGN IN STEEL II**

**(1-3)**

Application of the design principles to steel buildings, bridges, trusses, continuous beams and simple frames; detailing and fabrication procedures. Practical problems will be solved in the laboratory. Complete design and detailing of a simple steel building will be required by the students.

**CT. 263**

**STRUCTURAL DESIGN IN WOOD**

**(2-2)**

This course will cover the proper use of wood in structures; analysis, design and detailing of wood members of all kinds, such as columns, beams, trusses and arches; connections; glued laminated construction; mill construction; preservation of wood and wood piling.

**CT. 264**

**REINFORCED CONCRETE DESIGN I**

**(3-3)**

This is an introductory course in design of reinforced concrete structures. The course will cover review of flexural stresses in homogeneous beams; stresses in reinforced beams based on transformed section; bond; shear; diagonal tension; reinforced concrete columns and walls; floor systems; retaining walls; foundations.

**CT. 265**

**REINFORCED CONCRETE DESIGN II**

**(2-3)**

This course will cover application of the reinforced concrete to buildings, bridges and other structures. The course will consider design from consideration of behaviour of concrete structural members. Actual design problems will be solved in the laboratory.

**CT. 266**

**REINFORCED CONCRETE DESIGN**

**(3-0)**

This is an introductory course in design and reinforced concrete structures. The course will cover the application of reinforced concrete in building construction. Special attention will be given to slabs, beams, columns, foundations, retaining walls and floor systems. The detailing of the reinforced concrete structures will be stressed.

**CT. 267**

**STRUCTURAL DESIGN**

**(3-4)**

This course is designed to introduce students to elementary structural analysis and design in steel and wood. The study will include type of structural elements, framing and connections. The detailing of steel and wood structures will be stressed in the laboratory.

**CT. 271**

**HYDRAULICS I**

**(2-0)**

The subject is designed to give the student an understanding of basic hydraulics principles. The topics studied will include fluid statics; perfect fluids in motion; viscous fluids in motion; flow in closed conduits; flow in open channels; fluid metering and manometry, etc.

**CT. 272**

**HYDRAULICS II**

**(1-3)**

This course is a continuation of CT. 271. It is basically a laboratory course designed to illustrate the principles studied through suitable laboratory experiments.

**CT. 273**

**HYDRAULICS**

**(2-2)**

Basic principles of hydraulics, including fluid statics; perfect fluids in motion; viscous fluids in motion; flow in closed conduits; flow in open channels; fluid metering; manometry. These principles will be illustrated by suitable laboratory experiments.

**CT. 281**

**HIGHWAY DESIGN AND CONSTRUCTION I**

**(2-2)**

This course is intended to acquaint the students with the design and construction of roads and highways. Covered will be the principles of geometric design; grading and subgrades; drainage; low-cost surfaces; bituminous surfaces; concrete pavements; maintenance. Laboratory tests used for control of highway construction on materials will be undertaken.

**CT. 282**

**HIGHWAY DESIGN AND CONSTRUCTION II**

**(0-3)**

This course is a continuation of CT. 281. The students will be working in the laboratory on actual design problems in highway construction; quantity surveys; control tests and inspection.

**CT. 291**

**SANITARY ENGINEERING I**

**(2-2)**

The lecture portion of this unit will cover the following subjects: sources, treatment and distribution of water; collection, treatment and disposal of sanitary sewage and storm water. Laboratory work includes problem sessions on design of piping and pumping systems for water and sewage; analysis of water and sewage; operation of diatomaceous earth water filters.

**CT. 292**

**SANITARY ENGINEERING II**

**(0-2)**

A laboratory session for further application of principles learned in CT. 291. Actual assembly of various types of pipe joints; examination of the construction of various valves, hydrants and pumps; operation of a water treatment plant.

**DA. 101**

Introduction to the art of dental assisting and the role of dental assistants in the profession of dentistry. A series of lectures on each of Ethics and the History of Dentistry.

**DA. 102**

Basic Science course consists of a series of lectures on each of the following. General Physiology of the body. Pharmacology, Bacteriology, Oral Pathology, Reentgenology.

**DA. 103**

Includes lectures on the composition of dental materials, their physical chemical composition, limitations on their usage. Laboratory will provide opportunities to practice the technical procedures required in manipulating the various dental materials.

**DA. 106A**

**NUTRITION**

Required nutrients, calories in the diet, food facts, diet recommended, etc.

**DA. 106B**

**PSYCHOLOGY**

General consideration, motivation of patients, psychology of selling a service, personality improvement, factors influencing child behaviour, parent management, child management, etc.

DA. 106C

### DENTAL ASSISTING ARTS

Theory on general office and patient routine, sterilization, disinfection, first aid, public health, etc.

DA. 106D

### DENTAL ASSISTING TECHNIQUES

Practical aspects of sterilization, instrumentation, equipment care, assisting procedures, etc.

DA. 107

### PRACTICE MANAGEMENT

Instruction in basic procedures of office record-keeping, patient relationships and dental office supplies, etc.

DA. 108

### TYPING

Basic introductory course in typing, designed to bring students to a speed of 40 words (or more) per minute.

DA. 109

### ENGLISH

Basic English grammar, spelling, penmanship, economics, letter form, language laboratory skills, etc.

DA. 110

### BASIC HEALTH SCIENCES

Human anatomy, human behaviour, personal hygiene, basic nursing arts, health, etc.

DA. 111

### PHYSICAL EDUCATION

Organized sports (both indoor and outdoor) team sports, individual activities, etc.

DA. 121

### BASIC TECHNIQUES

(7-7)

Study of dental materials, instruments and operations; clinical practices; sterilization of instruments and apparatus; duties of the Dental Assistant in practice in relation to the dentist. Student will be required to perform set experiments and practice routine procedures of the dental surgery, record data, write up and interpret results.

DA. 202

### APPLIED PSYCHOLOGY

(1-1)

Study of basic psychology as it can be applied to dental surgery. Some practical aspects will be demonstrated with the aid of patients.

DA. 203

### PRACTICE MANAGEMENT

(3-0)

Instruction in the basic procedures of bookkeeping, charging of fees, and patient relationships; use of the denture card.

DA. 222

### PUBLIC HEALTH

(6-8)

Study and practice in Public Dental Health Education and school field trips to practising offices and clinics.

DA. 223

### CHAIRSIDE ASSISTING

(4-7)

Theory and practice in the chairside assisting of the dentist and dental surgeon in the various specific clinics and operations. Introduction to Roentgenology.

DM. 101

### ORIENTATION

(2-0)

Introduction to, and definition of, a Dental Mechanic's duties; brief history of the trade; lectures in ethics; introduction to nomenclature.

DM. 111

### ELEMENTARY CLINICAL PRINCIPLES

(4-1)

Introduction to the clinical or medical principles involved in dealing with live tissue in the oral cavity—basic hygiene, anatomy, bacteriology and pathology. Students will be required to perform set experiments, record data, write up and interpret results.

DM. 112

### ANATOMY

(4-1)

Detailed anatomy of the oral cavity—bone structure, muscle and nerve systems; blood vessels and vascular system; clinical history of teeth from childhood to the adult stage; basic general anatomy such as the heart and lungs. Students will be required to take extensive notes during this course and some laboratory work will be performed.

DM. 121

### DENTAL MATERIALS

(4-5)

Study of the physical and chemical properties of materials used in dental appliance construction; uses of the various materials and theory and practice in the handling of them in the dental laboratory, including acrylic resins, the various metals and alloys but not porcelain; simple metallurgy and the structures of metals; effect of heat treating and cold working on physical properties and corrosion resistance. Students will be required to perform set experiments, record data, write up and interpret results.

DM. 131

### DENTURE PROSTHESIS I

(5-4)

Study and practice of the methods of taking impressions, making casts and transforming these into dental plates and full dentures; construction, selection and setting of teeth; correction of dentures for evenness of bite. Students are required to perform routine procedures in construction and write up methods.

DM. 202

### PRACTICE MANAGEMENT

(6-2)

Study and practice in the fields of business administration, office management, personal conduct in these matters and basic general psychology as this can be applied to patients. Students will be required to undertake intensive study in this course and interpretation and evaluation is an important aspect.

DM. 213

### ORAL HEALTH

(6-5)

Review of the biological aspects, lesions, acrylic allergies and pathological conditions of the oral cavity; instruction on the responsibility of the Dental Mechanic to his patient in these matters. Students will have considerable practice in this field and will have the opportunity to study and work with patients.

DM. 232

### DENTURE PROSTHESIS II

(6-5)

Review of theories concerning the construction of full dentures, repairs to dentures and further practice on advanced techniques in the construction of dentures. Students will also be expected to prepare written material on this branch of Dental Science for oral presentation and discussion.

DN. 101

### ORIENTATION

(1-0)

Introduction to, and definition of, a Dental Technician's duties; brief review of the metric system and basic mathematical calculations; nomenclature; history and ethics.

DN. 111

### BASIC SCIENCES

(2-1)

Review of basic physics and chemistry; basic principles of designing; properties of common metals and alloys—their usefulness and limitations; structures of metals; effect of heat treating and cold working on physical properties and corrosion; physical testing of metals. Students will be required to perform set experiments, record data, write up and interpret the results.

DN. 112

**DENTAL ANATOMY**

(1-0)

Anatomy of the oral cavity—bone structure, muscular and vascular systems; history of teeth from childhood to the adult stage. This course will consist of lectures with demonstrations both in the classroom and the laboratory.

DN. 121

**DENTAL MATERIALS**

(4-4)

Study of the physical and chemical properties of materials used in dental appliance construction; uses of the various materials and theory and practice in the handling of them in the dental laboratory; including acrylic resins as well as porcelain and the various metals and alloys. Students will be required to perform set experiments, record data, write up and interpret the results.

DN. 122

**CERAMICS I**

(2-2)

Study of the theories and manufacturing processes in the construction of ceramic appliances. Students will be required to record data, write up and interpret experimental construction carried out in this field by an Instructor.

DN. 131

**DENTURE CONSTRUCTION I**

(4-3)

Study and practice of the techniques of transforming casts and impressions into dental plates; full and partial dentures; construction, selection and setting of teeth; correction of dentures for evenness of bite. Students are required to perform routine procedures in construction and write up methods.

DN. 141

**CROWN AND BRIDGE I**

(3-3)

Study and practice of the construction of dental crown and bridge work. Students will be required under the supervision of an Instructor to construct this type of prosthetic appliance.

DN. 202

**EQUIPMENT INSTALLATION AND REPAIR**

(2-0)

Basic knowledge required in Dental Laboratories to cope with the requirements and installation of the requisite equipment of the trade; maintenance and repairs to tools and equipment.

DN. 203

**PRACTICE MANAGEMENT**

(2-0)

Study and practice in office management, technician-patient and technician-staff relationships.

DN. 223

**CERAMICS II**

(4-4)

This course is a continuation of DN. 122 and will consist of further lectures and demonstrations in the field of construction of ceramic dental appliances. Students are not required to undertake extensive practice in this field—laboratory time is spent in watching demonstrations.

DN. 232

**DENTURE CONSTRUCTION II**

(5-5)

This will be a continuation of DN. 131 and will consist of advanced theory and practice in this subject.

DN. 242

**CROWN AND BRIDGE II**

(4-4)

This is a continuation of DN. 141, with advanced study and practice in the construction of dental crown and bridge work.

DT. 101

**ELEMENTARY DRAFTING**

(3-4)

This course embodies the basic principles of engineering drawing, consisting of the industrial methods used for lettering; proper techniques in the use of instruments; geometrical construction; orthographic projections; free hand sketching; representation of simple details of engineering character.

DT. 102

**ELEMENTARY DRAFTING**

(2-4)

This course covers the same material as DT. 101, but in slightly less detail.

DT. 103

**ELEMENTARY DRAFTING**

(2-3)

This course embodies the basic principle of engineering drawing, including technical lettering, use of drafting instruments, geometrical construction, orthographic projections, sections and auxiliary views.

DT. 104

**BASIC SKETCHING AND BLUEPRINT READING**

(0-2)

A basic course in lettering, technical sketching and reading of engineering drawings.

DT. 111

**DETAILING**

(0-3)

Axonometric and oblique projections; auxiliary views; sectioning; conventions; dimensions and notes; architectural blueprint reading.

DT. 112

**ELECTRICAL AND MECHANICAL DRAFTING**

(0-3)

Electrical symbols and wiring diagrams; blueprint reading; reproduction of drawings; elementary machine drawing.

DT. 121

**DRAFTING TECHNIQUES I**

(2-8)

Advanced geometrical construction; multi-view projection; auxiliary views; rotation; sections; axonometric and oblique projection; descriptive geometry; intersections and developments.

DT. 122

**DRAFTING TECHNIQUES II**

(2-8)

This course covers shop processes, blueprint reading and reproduction of drawings. The student will produce a complete set of working drawings for a small structure.

DT. 131

**GEOLOGICAL AND TOPOGRAPHICAL DRAFTING**

(1-4)

Systems of survey in Canada; topographic drafting from field notes and aerial photographs; contour and relief maps; elementary geology; map projections.

DT. 144

**MECHANICAL DRAFTING I**

(1-3)

Freehand sketching; axonometric views; piping symbols and drawings; welding symbols and drawings; pressure vessel codes and drawings; maps, map reading and blueprint reading.

DT. 145

**MECHANICAL DRAFTING I**

(2-3)

Auxiliary, axonometric and oblique views; sectioning; dimensions and notes; tolerances, limits and machine fits; finishes; cams, screws, fasteners, keys and springs; intersections and developments; revolutions; details of machine, structural and welding practices.

DT. 146

**MECHANICAL DRAFTING II**

(1-3)

Advanced problems including assembly layouts with specifications for materials, heat treatments, surface finishes and fits. From these layouts, detail drawings will be made in accordance with latest industrial practices.

DT. 147	<b>MECHANICAL DRAFTING I</b>	(2-3)	DT. 249	<b>PROCESS CONTROL DRAFTING</b>	(0-3)
	Axonometric and oblique projection; sectional views; dimensions and notes; tolerances and fits; threads, fasteners and springs.			Piping, welding and instrumentation symbols; process and process control flow sheets; reading of architectural and structural drawings; process and instrumentation equipment.	
DT. 148	<b>MECHANICAL DRAFTING II</b>	(2-3)	DT. 251	<b>STRUCTURAL DRAFTING I</b>	(2-4)
	Blueprint reading; shop processes; cams, gears, v-belt and chain drives; bearings; assembly drawings.			This course is designed to introduce the student to design office procedures in steel construction. Subjects include: structural steel and its fabrication; framing of simple beams; riveted joints; special beam connections; column details; welding procedures; design and details.	
DT. 154	<b>DETAILING</b>	(1-3)	DT. 252	<b>STRUCTURAL DRAFTING II</b>	(2-4)
	Symbols of building materials; basic structural drafting; highways. A complete set of drawings for a small building will be prepared.			A continuation of DT. 241 with emphasis on reinforced concrete details; engineering and placing drawings; fabricating shop practice; drawing office practice; reinforcing materials; accessories; typical drawings.	
DT. 155	<b>DESIGN DRAFTING</b>	(1-3)	DT. 271	<b>ELECTRONIC DRAFTING</b>	(0-3)
	Advanced structural drawing; highway design; shop practices; sanitary engineering layouts. Detailing of steel and reinforced concrete structures will also be taught in respective subjects.			Subjects covered are: Technical sketching, orthographic and axonometric projection; electrical and electronic symbols; block and schematic diagrams; chassis and panel layouts; connection diagrams and printed circuits; graphs and charts.	
DT. 161	<b>DRAWING &amp; SKETCHING</b>	(1-2)	Engl. 101	<b>INTRODUCTORY TECHNICAL ENGLISH</b>	(3-0)
	Advanced theory of projection; basic electrical and mechanical details; and techniques of multi-view and pictorial sketching.			This basic course will introduce the student to good study habits. The correct use of library facilities will be stressed to ensure that all technical information will be readily available for student use. A beginning will be made on technical report preparation. Consideration will be given to economics and the individual. Remedial speech and reading will be undertaken in the language laboratory as required.	
DT. 205	<b>ELEMENTARY DRAFTING</b>	(1-3)	Engl. 102	<b>COMMUNICATION SKILLS</b>	(3-0)
	This course covers the same material as DT. 103 but in slightly less detail.			Further development of communication skills. In developing reading comprehension, stress will be made on ensuring that the pupil can pass his information to others. This will be done through meetings and writing of business letters, reports and so on. Economics of the community will be investigated.	
DT. 213	<b>PIPING SKETCHING</b>	(0-2)	Engl. 103	<b>DATA PRESENTATION</b>	(3-0)
	Piping symbols; application of projection theory to piping drawings; sketch drawings and related blueprint reading; descriptive geometry.			Preparation and formal presentation of reports to groups both orally and visually will be stressed. The techniques included in applying for positions and being interviewed will be investigated. The economics of the country in relation to the individual will be assessed. The choice of a major report to be prepared and presented in the second year will be made in consultation with the technology concerned.	
DT. 214	<b>MECHANICAL DETAIL DRAWING</b>	(0-2)	Engl. 204	<b>REPORT PROJECT</b>	(0-3)
	Detailed piping drawings; developments and intersections; sheet metal drawings relating to air conditioning equipment.			The accumulation, organization and compiling of the major report will be undertaken. The presentation of a thesis in manuscript form as well as an oral dissertation on this theme will complete the formal English language training.	
DT. 215	<b>ESTIMATING AND DESIGN</b>	(0-2)	ET. 110		
	Material take-off; detail project of a complete air conditioning plant.			Fundamental electronic concepts. Electrical and radio symbols. Ohm's law. Kirchoff's laws. Power and energy. Magnetism, B.H. curves. Hysteresis, permeability, A.C. theory, Inductance and inductive reactance. Capacitance and capacitive reactance. Shielding, series and parallel resonance. Properties and uses of series and parallel resonant circuits. Elements and combined circuits of L, C, and R. Time constants fundamental. Filter networks. Vacuum tubes and transistors.	
DT. 232	<b>SURVEY AND TOPOGRAPHICAL DRAFTING</b>	(2-6)			
	Types and use of geological systems; historical and physical geology; geological maps from surface geology; seismic logs and information from drilled wells; map projections; reviews of survey computation and calculation of areas and volumes; plotting field survey notes.				
DT. 241	<b>MECHANICAL DRAFTING I</b>	(2-4)			
	Advanced work in projection drawing; descriptive geometry; intersections and developments; screw threads and fasteners.				
DT. 242	<b>MECHANICAL DRAFTING II</b>	(2-4)			
	Drawings and the shop; limits and fits; bearings, keys, rivets and springs; gearing and cams.				
DT. 243	<b>MECHANICAL DRAFTING III</b>	(2-4)			
	Subjects include mechanical drives; welding drawings; piping and pumps; pressure vessels; industrial electrical drawings.				

**ET. 111                    BASIC ELECTRICITY AND ELECTRONICS                    (8-0)**

Fundamental electrical concepts. Electrical and radio symbols. Ohm's law. Kirchoff's laws. Power and energy. Magnetism, B.H. curves, hysteresis, permeability. A.C. theory. Inductance and inductive reactance. Capacitance and capacitive reactance. Shielding. Series and parallel resonance. Properties and uses of series and parallel resonant circuits. Elements of combined circuits of L, C and R. Time constants fundamental. Filter networks. Vacuum tubes. Transistors.

**ET. 112                    DC and AC FUNDAMENTALS LAB.                    (0-12)**

Laboratory exercises are designed to teach the student the use of electronic shop tools and basic test instruments and, by the construction of suitable circuits, to provide experimental proof of the basic DC and AC circuit theorems. Emphasis will be placed on quality of workmanship, accuracy of readings and ability to interpret experimental results.

**ET. 113                    BASIC ELECTRONICS LAB.                    (0-12)**

Experiments familiarize the student with vacuum tubes and transistors functioning as rectifiers, audio frequency amplifiers, oscillators, diode detectors and heterodyne detectors. Exercises include fault analysis procedure for each type of circuit. Simple radio receivers are constructed and studied.

**ET. 115                    DC and AC FUNDAMENTALS LAB.                    (0-6)**

DC and AC Fundamentals I and II together comprise a course designed to teach the student the use of shop tools and basic test instruments, and by the construction of suitable circuits, to provide experimental proof of the fundamental circuit theorems. Emphasis will be placed on quality of workmanship, accuracy of readings and ability to interpret experimental results.

**ET. 117 - 118            ELECTRONICS LAB. I and II                    (0-6)**

Electronics Lab I and II together comprise experiments to familiarize the student with vacuum tubes and transistors used as rectifiers, audio frequency amplifiers, oscillators, diode detectors and heterodyne detectors. Exercises include fault analysis procedure for each type of circuit. Simple radio receivers are constructed and studied.

**ET. 121                    RADIO COMMUNICATIONS I                    (8-0)**

The discussion begins by describing the generation of a radio carrier wave with various types of oscillators and radio frequency amplifiers. Methods of amplitude modulation and frequency modulation of the carrier wave for radio transmission of sound then follow. The final portion of the course deals with the development of the superheterodyne receiver, the detection of FM carriers and special circuits used on high-performance communications receivers.

**ET. 122                    RADIO COMMUNICATIONS II                    (8-0)**

A continuation of ET. 121, this course deals with special transmitter circuitry, radio wave propagation, antenna design, transmission lines and feeders, single-sideband transmission and multiplex carrier systems.

**ET. 123                    HF COMMUNICATIONS LAB. I                    (0-12)**

Exercises in this lab course include the construction of RF and IF amplifiers, RF converters and a five-type superheterodyne receiver. Familiarization, fault-finding, tuning and adjustment assignments are carried out on standard AM superheterodyne receivers, FM receivers, auto radios, communications receivers, portable receivers, transistorized receivers and low power AM transmitters.

**ET. 124                    BASIC ELECTRONIC CIRCUITS                    (6-0)**

The following electronic circuits or components are studied: poster supplies, vacuum tube amplifiers, transistors and transistor amplifiers, oscillators, filters, superheterodyne, elements of tuning, modulation methods, basics of amplitude and frequency modulation; FM demodulation by de-tuning, discriminial, and radio detector.

**ET. 131                    INSTRUMENTS I    (4-0)**

This course discusses the circuit details of multimeters, volt-ohm-milliammeters, vacuum tube voltmeters, tube testers, DC and AC bridges, audio and RF signal generators, signal tracers and oscilloscopes. Fault analysis techniques using these instruments are described and demonstrated.

**ET. 135                    ELECTRONIC MEASUREMENTS                    (4-0)**

This course discusses the circuit details of multimeters, volt-ohm-milliammeters, vacuum tube voltmeters, tube testers, DC and AC bridges, audi and RF signal generators, signal tracers and oscilloscopes. Fault analysis techniques using these instruments are described and demonstrated.

**ET. 141                    SOUND SYSTEMS    (4-0)**

The objective of this course is twofold: first, to study the physics of sound and the means of electronic amplification of sound; second, audio amplifiers are presented as a practical design problem. Given certain conditions in a theatre, students are required to design a public address system suitable to meet these conditions at a minimum possible cost.

**ET. 173                    INDUSTRIAL ELECTRONICS                    (3-0)**

See ET. 274 for description.

**ET. 201                    BASIC ELECTRONICS                                    (3-3)**

Classroom lectures will deal with the analysis of simple DC circuits by means of Ohm's law and Kirchoff's laws, followed by a brief discussion of the sine wave, reactance, impedance and the action of vacuum tubes and transistors as rectifiers and signal amplifiers. Lab exercises will teach the student the use of electronic shop tools and basic test instruments during the construction of experimental circuits which are designed to illustrate the principles taught in the classroom lectures.

**ET. 202                    ELECTRONICS    (4-4)**

Classroom lectures begin with a review of basic electron theory and DC circuits. This is followed by AC theory and the fundamental principles of signal amplification by means of vacuum tubes and transistors. Finally, applications of electronics to instrumentation is discussed. Laboratory exercises, to demonstrate these principles, run concurrently.

**ET. 203                    ELECTRONICS    (0-2)**

This course features laboratory exercises in the applications of electronics to industrial instrumentation. Trouble shooting and basic repair are emphasized.

**ET. 224                    HF COMMUNICATIONS LAB. II                    (0-3)**

Lab exercises familiarize the student with the circuit details, adjustment and operation of typical commercial transmitters operating at frequencies up to 30 megacycles. Practical assignments in the construction and erection of simple HG antennas will be given.

**ET. 225 VHF AND UHF TELECOMMUNICATIONS (3-4)**

Classroom lectures will deal with the development and application of special VHF and UHF components, repeater systems and multiplex carrier equipment. Lab exercises will familiarize the student with the circuit details, adjustment and maintenance of typical commercial VHF and UHF transmitters, receivers, antennas, multiplex carrier equipment and the special test equipment required for such maintenance.

**ET. 232 INSTRUMENTS II (3-0)**

A study is made of the more advanced test instruments used in Electronic Laboratories, such as precision audio and video signal generators, precision RF signal generators, frequency standards, pulse counters, precision potentiometers, AC bridges, Q-meters, digital voltmeters, transistor curve tracers, distortion analysers, broadband pulsed sweep oscilloscopes and gaussmeters. The applications of these instruments are discussed.

**ET. 233 INSTRUMENT LAB. (0-6)**

Practical assignments in this course familiarizes the student with the application and calibration of the advanced laboratory instruments discussed in ET. 232. Further practice in calibration is provided by checking and recalibrating the test instruments used in the Basic Electronic Labs.

**ET. 251 TELEVISION THEORY (6-0)**

The conversion of an optical image to a video signal by the TV camera is dealt with first, followed by a discussion of TV synchronization circuits. Development of the composite video-sound carrier and its transmission to the TV receiver is described next. Finally, the TV receiver is discussed in detail, showing how it amplifies the composite video-sound signal, separates the video and sound components, demodulates each of these components and ultimately reproduces the original sound and optical image. The theory of color television transmission will be taught and demonstrated.

**ET. 252 TELEVISION LAB. I (0-6)**

Lab exercises will show the TV receiver to be an excellent example of an accurately synchronized system of pulse circuitry, the principles of which are universally important in electronics. The TV receiver will be used as a vehicle for teaching advanced methods of fault analysis and for illustrating the use of the more advanced test instruments.

**ET. 253 TELEVISION LAB. II (0-3)**

Experiments familiarize the student with the circuit details, operation and maintenance of TV cameras, "sync" generators and studio monitor consoles. Applications of TV camera chains will be illustrated in the fields of Industrial TV and Educational TV.

**ET. 254 PULSE THEORY (3-0)**

The generation, shaping and structure of non-sinusoidal waveforms. Pulses; limiters and clippers; DC restoration; multi-vibrators; blocking oscillators; saw-tooth generators; pulse amplification; delay-lines.

**ET. 255 TRANSISTOR THEORY**

Review fundamental transistor theory; bias stabilization; audio amplifiers; tuned amplifiers; wide band amplifiers; oscillators; switching circuits.

**ET. 261 MICROWAVE AND RADAR THEORY (5-0)**

The discussion will include the nature and behavior of microwaves, special microwave components, such as waveguides, cavity resonators, klystrons, magnetrons, travelling wave tubes, UHF diodes and microwave antennas, and the operation and application of special microwave test instruments. The radar transmitter-receiver will be described as a typical microwave application.

**ET. 262 MICROWAVE AND RADAR LAB. (0-6)**

This lab course provides experiments to illustrate the nature of microwave radiation. It familiarizes the student with special microwave components and test gear, and concludes with exercises on a working radar installation.

**ET. 271 INDUSTRIAL ELECTRONICS (4-0)**

This course will include the basic principles of digital and analog computers, electrical transducers, synchros, servo-mechanisms, magnetic amplifiers, thyatron, nuclear scalers and ratemeters. Further study will be made of pulse circuits and semi-conductors. In conclusion, lectures will be given on some typical industrial electronic control systems.

**ET. 272 INDUSTRIAL ELECTRONICS LAB. (0-9)**

Lab exercises are designed to illustrate the working principles and application of pulse circuitry, digital circuitry, analog computers, counters, scalers, photo electric cells, industrial transducers, servo-mechanisms, thyatron control circuits, geiger counters and magnetic amplifiers. Students will be required to design transistorized versions of suitable pulse circuits, digital circuits or simple industrial control systems.

**ET. 274 ELECTRONICS LAB. III (0-6)**

Industrial Electronics and Electronics Lab III, together comprise lecture and laboratory exercises designed to teach the student the fundamentals of thyatron motor controls, servo-mechanisms, time delay circuits, photo electric relays, industrial applications of electrical transducers, tone operated relays, remote radio control and basic digital computer circuitry.

**DETAILS OF FIRST YEAR SUBJECTS  
THEORY OF FOOD 120 hours****FS. 100**

1. Abbreviations as used in the industry; volume measures usually liquid Imperial and American measure.
2. Basics; food preparation terms, their meanings. Demonstrations given to illustrate food preparation procedures. Menu and cookery terms. Temperatures, oven, grill, fat frying, simmering and boiling, refrigeration temperatures. Leavening agents, yeast, baking powder, air.
3. Introduction and application of portion control.
4. Fish; cooking methods, selection of and method of recognizing fresh fish in good condition.
5. Poultry; general classification, turkey, duck, chicken, suitable ages for various cooking processes.
6. Sea food; shrimps, oysters, scallops, lobster, crab, etc.; cooking and preparation methods.
7. Cooking methods described; sauteing, deep frying, braising, roasting, baking, poaching, etc.
8. Milk, eggs, cheese; major uses, care, handling, storage.
9. Vegetable cookery; steam cooking, pressure methods, glazing root vegetables.
10. Field trips; students visit local restaurants, hotels, institutions, meat packing plants, flour mills, dairies, etc.

**FS. 101 KITCHEN MANAGEMENT AND SANITATION 50 hours**  
Menu-making, work allocation, buying procedures and techniques. Receiving deliveries, storekeeping procedures, checking weights and quality. Taking inventory. Maintaining and operating kitchen dining room and coffee shop equipment. Avoiding waste, using left-over food. Preparing for banquets. Rotation cooking.

Sanitation responsibilities, personal hygiene. Handling food, rules and methods explained, Provincial Health Regulations. Food storage, correct temperatures. Dishwashing procedures, cleaning schedules, maintenance problems. Care and cleaning of equipment. Building requirements. Canopies and grease traps. Film and discussion periods. Visit by local inspectors to take swabs, etc.

**FS. 104 SHOPWORK (STATIONS) 630 hours**

A. BAKERY AREA—which consists of four sections.

1. Yeast section
2. Pastry section
3. Fillings and desserts
4. Cakes and cookies

B. KITCHEN AREA—which consists of five main sections.

1. Grill and roasting
2. Vegetable section
3. Soups and sauces
4. Larder or preparation
5. Salad and sandwich area

### DETAILS OF SECOND YEAR SUBJECTS

**FS. 200 THEORY OF FOOD 120 hours**

Demonstrations of classical sauces, basic and subsidiary sauces. Entrees; casseroles, babas, cake decorating and sugar work.

Garde manger work demonstrated; sausage making, various cold pies, decorating hams, cold salmon and similar items; various cold sauces, mayonnaise, chaud froid, aspic jelly, etc.

Demonstrations of classical sauces, basic subsidiary sauces. Entries; casseroles, goulash, grilled items, etc.

Cooking of lesser known vegetables, artichokes, aubergine, Belgian endive, zucchini, braising celery, etc.

**FS. 201 KITCHEN MANAGEMENT AND SANITATION 50 hours**

A continuation of the instruction in the first year of this subject, with greater emphasis on storekeeping procedures, menu planning and making, and maintenance of equipment. These classes also include some demonstrations on the maintenance of dishwashing machines, thus assuring reliable operation of essential apparatus.

**FS. 204 SHOPWORK (STATIONS) 630 hours**

The students rotate through the various stations in a similar manner to that of the first year. However, the work is frequently at a higher level and requires the student to develop extra skills and to assume a greater degree of responsibility.

1. Food Lab Section

The preparation of small quantities of soups, entrees, roasts and grilled items together with the correct sauces and accompaniments, is involved. Emphasis is on producing a quality, "finished" product of standard equal or superior to that of a first-class restaurant. Stations are rotated so as to cover the duties of sauce cook, roast cook, vegetable cook, etc.

2. Garde Manger Section

Students receive instruction in:

- (a) Meat cutting, basic and advanced meat preparation for classical cooking.
- (b) Preparation of cold hors d'oeuvres.
- (c) Advanced salad work.
- (d) Sausage making, galantines, aspics, cold pies, etc.
- (e) Creation of buffet items and centerpieces.
- (f) Storekeeping procedures.
- (g) Correct storage methods, refrigeration, etc.

3. Large Scale Production Kitchen Section

The practical work in this section is similar to the first year's instruction. Second-year students assume more responsibilities and thus benefit from their second introduction to this busy and fast moving section. They develop speed and dexterity in the "cafeteria line."

4. Bakery Section

Advanced work in this section covers many subjects: Classical desserts, advanced puff pastry work, experience with gum paste (pastillage), chocolate and nougatine.

Students are given projects in which they develop skills in producing show pieces for culinary exhibitions.

The decoration of cakes has considerable emphasis; this includes wedding and anniversary cakes, etc. French pastries of all types are produced, including Genoese pastry, choux pastry, German pastry, etc.

**GT. 101 INTRODUCTION TO GAS TECHNOLOGY (3-0)**

History—the chronology and growth of the production, transmission and utilization of natural gas. Geology—the origin of petroleum; geological time scale; types of reservoirs; criteria for economically productive reservoirs and methods of determining same. Exploration—survey methods (seismic and gravity); drilling equipment and drilling techniques. Production—completion methods and operations; stimulation techniques; sub-surface and surface control equipment.

**GT. 111 VALUATION OF RESERVES (3-3)**

Methods of gas flow measurement—critical flow prover; orifice meter; venturi meter; rotary meter; velocity vortex meter and mass flowmeter. Gas well testing—methods of conducting back-pressure tests; measuring and/or calculating static and flowing reservoir pressures to determine absolute open flow potentials. Valuation—methods of applying AOPP data and reservoir volume data to determine the value of natural gas reserves.

**GT. 121 HYDROCARBON PHASE BEHAVIOUR (2-0)**

Gas properties—chemical composition and physical properties of natural gas. Measurement—engineering units of measurement; methods of measuring and/or calculating the properties of natural gas. Gas law manipulation—the application of and deviation from the laws of Charles, Boyle, Avogadro and Dalton in problem solving.

**GT. 202 CODES AND REGULATIONS (3-0)**

Construction and operating codes—a review of the statutes, acts and codes which affect the development of natural gas production facilities. Some lectures may be given by representatives of the Electrical Inspector's Branch and the Boiler Inspector's Branch. Oil and Gas Conservation Board Regulations—a study of the regulations governing the discovery, production, processing, transmission and sales of natural gas in Alberta. Some lectures may be given by representatives of the Oil and Gas Conservation Board.

GT. 203

**SEMINAR**

(0-3)

Field trips to the various gas processing plants in the Edmonton area. Discussion groups, committee reports and training films will be used to present "on-the-job" situations which will be encountered by graduates in industry.

GT. 231

**FIELD HANDLING I**

(3-3)

Lease equipment—the purpose, construction and operation of separators, heaters, dehydrators, dryers and flow controllers. Hydrates—their definition, manner of formation and how to control, prevent and dispose of them. Testing—methods of determining the condition of natural gas in the field—Acme balance, dew point tester, dead weight gauge and other field testing instruments.

GT. 232

**FIELD HANDLING II**

(3-3)

Advanced theory in the operation of field processing equipment; methods and formulae used in the determination of equipment types and sizes; methods of installation of lease processing equipment. Field trips will be taken during this course to observe field installations in operation.

GT. 241

**GAS PROCESSING**

(3-0)

A study in the methods used in natural gas processing plants for the purification of raw gas. Process methods—fractionation, distillation, refrigeration, dehydration and adsorption processes employed in the removal of liquid hydrocarbons. Acid gas removal—the chemical processes involved in the removal of carbon dioxide and hydrogen sulphide from raw gas to produce saleable natural gas.

GT. 242

**GAS PLANT OPERATIONS**

(2-3)

Corrosion—the importance of its control and methods employed in its prevention. Economics—the estimation of capital and operating costs. Miscellaneous plant equipment—stabilizing columns, condensers, heat exchangers, reboilers, stock tanks and loading racks. A general study of the operation of the various types of gas processing plants.

GT. 251

**GAS TRANSMISSION**

(4-0)

History—the chronology and growth of gas transmission facilities. Flow formulae—the various methods used in the sizing of gas transmission lines. Compressors—types of compressors, prime movers, auxiliary equipment and facilities; methods of sizing, locating and installing complete compressor booster stations.

GT. 261

**GAS ANALYSIS**

(0-3)

Gas analysis methods—how to operate the gas chromatograph, Podbielniak, Tutowler, Orsat and Austin Titrator apparatus. The construction and principle of operation of each of these apparatus will be studied. Gas behaviour determination—construction, principles and operation of the Burnett compressibility cell and the PVT cell.

GT. 271

**EQUIPMENT AND PIPELINE DESIGN**

(3-3)

Formulae, criteria and the use of handbooks for the designing of pressure vessels and pipelines with regard to process and pressure limitations. The use of various types of metals for specific conditions of corrosion, high pressure, etc., will be studied. Field trips will be made to equipment manufacturers to observe the construction of pressure vessels.

HDT. 100 **HAND AND POWER TOOL OPERATING** 70 hours

Operation and skill in the use of files, squares, rules, calipers, drills, taps, dies, drill presses and grinders. Soldering: Black iron, galvanized and tin; use of fluxes; reconditioning soldering coppers. Job layout, mechanics' tools, blueprints, measuring devices, etc.

HDW. 100 **OXY-ACETYLENE WELDING** 80 hours

Care of equipment, safety, construction of welding tanks. Theory of general welding practice preparation. Shopwork on fusion welding of mild steel, cast iron and aluminum. Butt welding mild steel in all positions. Lap and fillet welding. Oxy-acetylene cutting. Brazing and silver soldering. Emphasis is placed on safety and knowledge of technical requirements rather than on developing a high degree of skill.

HD. 101 **HEAVY EQUIPMENT SHOP** 60 hours

Elementary work on engines including complete disassembly of various makes, inspection, construction, operation and nomenclature of parts. Use of special tools and gauges, measuring instruments, micrometers, telescopic gauges, etc. Measuring clearances. Tracing oiling and cooling systems, oil pumps, water pumps. Valve reconditioning methods. Valve and ignition timing on running models. Use of torque wrenches.

HD. 102 **HEAVY EQUIPMENT THEORY** 40 hours

A study of the theory governing the operation of the internal combustion engine, clutches, transmissions, drive lines, rear axles, differentials, brakes, front-end and steering, tire repair, fuel systems, and elementary considerations and discussions connected with the electrical system including batteries, starters, generators, distributors and magnetos. Compression ratios and fuel. Cooling and lubricating systems.

HD. 103 **HEAVY EQUIPMENT SHOP** 150 hours

**Engines:** Disassembly: Cleaning, measuring wear. De-glazing, reboring and honing cylinders. Fitting pistons. Sleeve installation. Fitting rings, piston pins and bushings. Replacing camshaft bearings. Demonstration of alignment boring. Fitting main and connecting rod bearings. Alignment of connecting rods. Demonstration of crankshaft grinding. Overhauling oil pumps and water pumps. Checking and replacing hose connections and thermostats. Replacing timing gears. Valve and ignition timing. Engine assembly to recommended clearances using all special tools required. Special emphasis on the use of torque-wrenches.

**Clutches:** Overhauling and trouble finding. Removing the transmission. Replacing clutch disc, checking pressure plate, assembly inspecting the release bearing. Assembling and aligning the clutch, replacing transmission, adjusting the clutch-pedal clearance. Use of special tools.

**Transmission:** Introduction to torque converters and automatic transmissions. Removing the transmission from the chassis, disassembling, cleaning and inspecting parts. Checking and adjusting shaft and gear end-play. Assembling, installing and aligning in chassis. Adjusting linkage. Installing and adjusting power take-offs, winches and cable control units. Use of special tools as required.

**Drive Lines:** Removing, inspecting and packing universal joints. Alignment and replacement of universal joints.

**Front- and rear-axle Drives:** Removing from the chassis, disassembling, washing and inspecting for worn or damaged parts. Positioning pinions and pre-loading pinion bearings. Installing the cage assembly in housing. Adjusting differential side bearing pre-load. Adjusting crown-gear pinion backlash. Checking tooth

contact. Installing pinion and axle grease seals. Adjusting axle shaft end-play. Use of special tools.

**Brakes:** Removing hubs, brake shoes and linkage. Relining brakes. Measuring brake drum wear. Turning brake drums. Removing wheel cylinder cups. Rebuilding wheel and master cylinders and honing if necessary. Adjusting pedal clearance. Replacing hubs. Adjusting brake shoes. Bleeding hydraulic brakes. Servicing vacuum air and electric brakes. Use of all special tools and equipment required for brake work.

**Steering:** Removing, overhauling, adjusting and replacing parts on both wheel and track type assemblies. Installing sector bushings and honing. Rebuilding of individual suspension units. Replacing kingpins and bushings, reaming same if necessary. Testing and replacing shock absorbers, wheel alignment, wheel balancing, centering steering. Checking tracking. Use of special tools and steering equipment. Hydraulic steering assists.

**HD. 104                   HEAVY EQUIPMENT THEORY                   100 hours**

A study of all details of construction, methods of making adjustments, and allowances for wear on engines and heavy-duty machines. Engine performance. Horsepower; indicated, brake and drawbar. Transmission of power, torque, multiplication, planetary gears; gear ratios, pulley speeds, sprocket torques. Types of ground contact, rolling resistance and slippage. Tire mounting. Use of test equipment (e.g., dynamometer). Starting and run-in procedure. Types of starting and air intake systems.

**HD. 105                   HEAVY EQUIPMENT SHOP                   150 hours**

Practise in the operation, care and use of ammeters, voltmeters, ohmeters, automatic voltage regulators, growlers, test lamps. Testers for distributors, generators, batteries, coils, condensers, compression and vacuum. Exhaust-gas analyzers, pyrometers, cam-dwell meters, timing lights, etc. Shopwork involving the use of special analyzing equipment for testing and rebuilding diesel-engine injection pumps and valves.

**HD. 106                   HEAVY EQUIPMENT THEORY                   100 hours**

A study of the principles underlying the operation, maintenance, and care of all the electrical equipment connected with the modern engine, with particular reference to starters, generators, voltage regulators, distributors, magnetos, electrical circuits, the storage battery, and the techniques involved in connection with modern tune-up work and tests of performance. Theory of fuel pumps, carburetion including liquefied petroleum gas systems. Study of fuel-injection equipment including field-testing procedure.

**HD. 200                   ELEMENTS OF HEAT ENGINES                   (0-6)**

A theoretical study of the elementary principles of heat engines and of thermodynamics, together with experiments in the engines lab on such units as a tri-fuel engine, gas turbines, gasoline and diesel engines coupled to dynamometers and a natural gas engine.

**HD. 201                   ADVANCED HEAVY EQUIPMENT SHOP                   (0-6)**

Advanced shop involving the use of special analyzing equipment for testing and rebuilding diesel-engine injection pumps and valves. Diesel-engine governors, electrical shut-down devices and trouble-shooting methods using a dynamometer. Diesel engine types including modern high-speed automotive and truck. Starting, lubricating and cooling systems. Air-intake and exhaust systems. Indoor ventilating systems. A.C. generators and transistor-type voltage-regulators.

**HDB. 200**

**BOOKKEEPING**

(5-0)

This is a basic course in bookkeeping in which the student will learn the principles of the double-entry system. The various journals will be introduced as well as the profit and loss statement and balance sheet. Adequate and accurate keeping of records will be emphasized.

**HD. 203**

**ADVANCED HEAVY EQUIPMENT SHOP**

(0-6)

Shop demonstration involving: fluid couplings, torque converters and amplifiers, special automatic-type transmissions. Hydraulic pumps, rams and control valves. Air pumps, compressors and other special types of allied equipment. The actual operating and pre-delivery testing of Heavy Duty Equipment involving techniques necessary to assure proper performance and customer satisfaction.

**HDB. 230                   BUSINESS ADMINISTRATION AND PERSONNEL MANAGEMENT                   (2-0)**

In this course, the student will be made aware of the many problems of managing a business. Proper organization and control of the physical plant and of personnel will be of major concern.

**HDB. 240                   RETAIL MERCHANDISING AND COLLECTIONS                   (5-0)**

This course is designed to acquaint the student with the problems and principles of retailing. Problems of buying, displaying, advertising, selling, and inventory control are all covered in a very simple but practical way. Credit and collections are also a very important and integral part of this course.

**IE. 101**

**ELECTRICITY I**

(2-2)

DC circuits—current; voltage; power; electromagnetism. AC circuits—current; voltage; power; power factor; single and polyphase circuits; DC and AC generators and motors.

**IE. 102**

**ELECTRICITY II**

(1-2)

Transformers; AC motor controls and starters; safety and remote controls. Basic electronics; photo-electric controls; transducers; strain gauges.

**IE. 106**

**ELECTRICITY I**

(3-2)

Basic electrical course on DC and AC currents components, voltage, current, power, measurements, magnetism and electromagnetism. Wiring methods.

**IE. 107**

**ELECTRICITY II**

(1-2)

AC circuits, instruments, measurements, fractional horsepower motors and controls, maintenance and repair.

**IE. 111**

**CODES AND SAFETY I**

(1-0)

A study of the relationship between the Electrical Protection Act, Municipal Bylaws and the Canadian Electrical Code. Canadian Electrical Code sections on definitions, general rules and conductors.

**IE. 112**

**CODES AND SAFETY II**

(1-0)

Further to IE. 111. Canadian Electrical Code—remote control circuits and signal and low voltage circuits, first aid on electrical shock.

**IE. 113**

**CODES AND SAFETY III**

(1-0)

Further to IE. 112. Canadian Electrical Code—wiring methods.

IE. 121	<b>DC CIRCUITS AND METERS</b>	(4-0)	IE. 203	<b>ELECTRICITY I</b>	(2-3)
	Basic concepts of electricity; basic electrical units; sources of EMF; single electrical circuits; magnetism and electromagnetism; magnetic circuits; DC measuring instruments; volt ohm, milliammeter. Introduction to transient R-L-C circuits.			DC circuit elements and laws; measurement of current, voltage, resistance and power; wire size. Magnetism and electromagnetism; Faraday's laws of induction; self and mutual induction and capacitance; series and parallel circuits; DC generators and motors.	
IE. 122	<b>DC CIRCUITS AND METERS LAB.</b>	(0-10)	IE. 204	<b>ELECTRICITY II</b>	(2-3)
	Use are care of hand tools; wire splicing and soldering; laboratory circuit work using Ohm's and Kirchoff's laws; use and care of DC meters, laboratory circuit assignments paralleling Electrical Theory IE. 121.			Time varying circuit elements; resistance, capacities and inductance in series and parallel; power and power factor; basic transformers, single and polyphase voltage generation; voltage, current and volt-ampere relations for Wye and Delta connected generation and load; AC motors.	
IE. 123	<b>DC AND AC CIRCUITS I</b>	(5-0)	IE. 205	<b>ELECTRICITY III</b>	(2-3)
	Transient analysis of R-L and R-C circuits; electromagnetic induction; simple AC and DC generators; AC circuit components and circuits; single phase circuits; simple transformers; use of Vacuum tube voltmeter and Oscilloscope.			DC and AC motor starting equipment; across the line and step starters; safety devices; remote control circuits; switchboard equipment. Basic industrial electronics; vacuum tubes; power supplies; voltage amplifiers; phase shift circuits; electronic motor controls.	
IE. 124	<b>DC AND AC CIRCUITS LAB. I</b>	(1-10)	IE. 214	<b>CODES AND SAFETY IV</b>	(1-0)
	Laboratory experiments paralleling theory IE. 123; low voltage signal systems; lighting switching; bells; buzzers, relays and simple fire alarm systems.			Further to IE. 113, covering installation of wiring and equipment.	
IE. 127	<b>DC CIRCUITS AND METERS</b>	(2-2)	IE. 215	<b>CODES AND SAFETY V</b>	(1-0)
	DC circuit elements and laws; measurement of current, voltage, resistance, power; magnetism and electromagnetism; Faraday's laws of induction; self and mutual inductance; capacitance; series and parallel circuits; DC meters.			Further to IE. 214, covering protection and control.	
IE. 128	<b>AC CIRCUITS</b>	(3-2)	IE. 216	<b>CODES AND SAFETY VI</b>	(1-0)
	Time varying circuit elements and circuits; power and power factor; single and polyphase voltage generation; voltage, current and power relations for Wye and Delta connected generators and loads.			Further to IE. 215, covering installation of equipment, motors and motor controls.	
IE. 131	<b>HEATING AND CONTROL CIRCUITS</b>	(1-2)	IE. 217	<b>WIRING PRACTICE AND CODES</b>	(2-0)
	Components, analysis and circuitry for residential and light commercial heating controls.			Wire sizes and current carrying capacity; study of applicable portions of Canadian Electrical Code; wiring diagrams.	
IE. 141	<b>ELECTRICAL MACHINES I</b>	(6-0)	IE. 225	<b>DC AND AC CIRCUITS II</b>	(4-0)
	DC generators; DC motors and basic controls; AC generators; single phase AC motors and controls; transformers; fluorescent lighting.			Review of IE. 123; time varying circuits; mathematical analysis; vector representation; series and parallel AC circuits; polyphase circuits; two- and three-phase circuits; power factor.	
IE. 142	<b>ELECTRICAL MACHINES LAB. I</b>	(0-8)	IE. 226	<b>DC AND AC CIRCUITS II LAB</b>	(0-8)
	Laboratory experiments paralleling IE. 141, using electrical machines and equipment.			Laboratory experiments to parallel IE. 225.	
IE. 145	<b>ELECTRICAL MACHINES AND CONTROLS</b>	(3-4)	IE. 243	<b>ELECTRICAL MACHINES II</b>	(5-0)
	DC and AC motors and starters and controls, safety devices and remote controls; transformers, control circuits.			Review of IE. 141; further detail study on DC and AC generators and motors; transformers; magnetic switching controls; voltage regulators; introduction to power generation; engine and turbine drives.	
IE. 151	<b>ELECTRONICS I</b>	(3-2)	IE. 244	<b>ELECTRICAL MACHINES LAB II</b>	(0-10)
	Vacuum tubes; gaseous electron tubes; photo tubes; cathode ray tubes and transistors as circuit elements. Laboratory experiments to determine their characteristics, and simple circuits.			Laboratory experiments to parallel IE. 243.	
			IE. 252	<b>ELECTRONICS II</b>	(4-4)
				Rectification and power supplies with filters; small signal amplifier analysis; power amplifiers with vacuum tubes, gaseous tubes and solid state devices; special electrical and electronic detectors of industry.	

IE. 261	<b>INSTRUMENTS AND MEASUREMENTS I</b>	(2-4)	IP. 106	<b>MACHINE SHOP II</b>	(0-2)
	Use, care, construction and circuitry of single phase meters; AC voltmeters; ammeters; wattmeter; watt-hour meter; frequency meter; power-factor meter; vacuum tube voltmeter; oscilloscope; DC and AC bridges, audio signal generators.			The care and use of hand tools for metal removal, for metal parting, for working out and measuring, for operating fastening devices and work holding, for threading. Special emphasis on sheet metal layout and panel working. The use of precision measuring instruments—micrometer, vernier micrometer, vernier protractor, etc.	
IE. 262	<b>INSTRUMENTS AND MEASUREMENTS II</b>	(2-4)	IP. 111	<b>WELDING</b>	(1-2)
	Current transformers; voltage transformers; protective relays and circuit breakers; three phase metering; electronic instruments and control.			A study of oxy-acetylene and arc welding as it applies to machine construction, fabrication and repair. Oxy-acetylene process—properties of gases, physical properties of welds, flame cutting, brazing, hard surfacing. Electric process—types of arc welding equipment, types of electrodes, multi-pass welding, hard surfacing, stress relief, physical testing.	
IE. 263	<b>INSTRUMENTS AND MEASUREMENTS</b>	(2-0)	IP. 113	<b>WELDING AND PANEL FABRICATION</b>	(1-2)
	DC and AC electrical and electronics instruments used for measuring voltage, current, power, resistance, power factor, temperature pressure, etc., related to air conditioning equipment and systems.			Same as IP. 111, with additional stress on panel fabrication as applied to Instrumentation Technology.	
IE. 271	<b>INDUSTRIAL CONTROLS</b>	(4-0)	IP. 121	<b>MANUFACTURING PROCESSES I</b>	(2-1)
	Closed cycle industrial control circuit elements and systems using rotary amplifiers, magnetic amplifiers and electronic amplifiers, including solid state components.			Sheet Metal Work: Use of hand tools, layout, surface development, machine tool demonstrations; soldering; seaming and edges, notches, fastening devices and tools employed; spot welding; material selection.	
IE. 272	<b>INDUSTRIAL CONTROLS LAB</b>	(0-8)	IP. 122	<b>MANUFACTURING PROCESSES II</b>	(3-1½)
	Laboratory experiments assigned on electrical machines and industrial controls—parallel to theory of IE. 271.			Rudiments of pattern making; sands and their uses; the construction and application of moulds; the casting; types; materials used. Conditions for advantageous employment of castings; casting faults; methods of inspection; furnace operation; cost estimates. The use and care of hand tools for various purposes; drilling machines, the shaping machine, the lathe. Introduction to charting of machine operations.	
IE. 273	<b>PROTECTIVE DEVICES AND CONTROLS</b>	(2-0)	IP. 123	<b>MANUFACTURING PROCESSES III</b>	(3-3)
	Electro-pneumatic control circuit elements; relays; safety devices; limit switches; basic electronics; special electronic controls used in air conditioning systems.			Oxy-acetylene welding—properties of gases; physical properties of welds; flame cutting; brazing; hard surfacing. Electric welding—types of arc welding equipment, types of electrodes, multi-pass welding, hard surfacing, stress relief. Deposition rates for various types of welds on differing plate thicknesses. Machine Shop—shaping and milling machines and the horizontal boring mill.	
IE. 281	<b>CIRCUIT DESIGN</b>	(3-2)	IP. 131	<b>APPLIED MECHANICS I</b>	(4-2)
	Design of commercial and industrial electrical installations including lighting; power distribution; motors and controls; control systems.			Dynamics; kinematics of a moving particle. Velocity, acceleration, relative velocity, relative acceleration. Analytical and graphical approaches. Acceleration and velocities of points in mechanisms, etc. Newton's laws of motion. Force, work, power, energy potential and kinetic. Motion in a circle. Flywheels, energy fluctuations. Friction, angle of; co-efficient of; friction on the inclined plane. The forces on and the efficiency of screw threads. Friction and clutches, brakes, rope and belt drives, etc.	
IndRel. 201	<b>INDUSTRIAL RELATIONS</b>	(2-0)	IP. 132	<b>APPLIED MECHANICS</b>	(3-2)
	Includes the historical background of industrial development with the economic changes involved, together with a survey of the problems facing management today, especially with regard to factory operations. Principal topics include line and staff organizations, departmental functions, costs and budgets, purchasing, labor relations, wage and classification administration and personnel management.			Centroids; equilibrium; systems of units; scalar and vector quantities; speed and velocity; acceleration; inertia; friction; work; energy; momentum; elasticity; fluid flow; fundamentals of thermodynamics.	
IndRel. 202	<b>INDUSTRIAL RELATIONS</b>	(4-0)			
	Description as for IndRel. 201, with increased emphasis in all fields, together with a study of the sociological effects of present and future trends in industrial practices.				
IP. 100	<b>INTRODUCTION TO PRODUCTION ENGINEERING</b>	(1-0)			
	Its history and development. The Professional Societies and Institutions. The scope of production engineering. The present status and application of production engineering. The future outlook.				
IP. 105	<b>MACHINE SHOP I</b>	(0-2)			
	Instruction and shop practice in the following: pipe fittings—compression, threaded, welding and flanged; valves—gate, globe and cock types; hangers and accessories—hangers, rods, brackets, protection equipment; hand tools—piping, woodworking; shop practice—threading, flaring, bending, testing, soldering.				

IP. 201	<b>MACHINE SHOP I</b>	(1-2)	
	The care and use of hand tools for metal removal, for metal parting, for marking out and measuring, for operating fastening devices and work holding, for threading. The power saw. Drilling machines; types and use. Introduction to heat treatment. Introduction to the lathe and shaping machine. The use of precision measuring instruments. Project involving benchwork and drilling machines.		
IP. 202	<b>MACHINE SHOP II</b>	(1-2)	
	Tools. Making, hardening and grinding tools for lathe and shaping machine. Operation of lathe and shaping machine. Demonstration work on more complex drilling machines, lathes, and shaping machines. Projects involving benchwork, drilling, turning and shaping.		
IP. 203	<b>MACHINE SHOP III</b>	(1-2)	
	Fundamentals of welding—its advantages and limitations, care of equipment and safety, arc welding, oxy-acetylene welding, brazing, silver soldering, flame cutting, arc gouging. An introduction to the Sheet Metal trade including the layout and fabrication of a simple project. An introduction to foundry practice including the production of a simple casting in aluminum or brass.		
IP. 204	<b>MACHINE SHOP IV</b>	(1-4)	
	Presentation of a component which can be designed for production by casting, welded fabrication or machining; the relative costs with consideration to the quality and necessary finish of the product; investigation of actual costs involved in producing by all three methods. Introduction to tool design including hardening of a simple die and subsequent metal removement by spark erosion machine. Introduction to numerically controlled equipment including cutting of tapes and applications to drilling operations.		
IP. 212	<b>SHEET METAL</b>	(1-2)	
	Use of hand tools; machine demonstrations; layout—allowances, surface development—parallel, radial, triangulation; soldering; seams and edges; notches; fastening devices and tools employed; dampers; grilles and diffusers—types, construction, aspect ratios, radius ratios, turn blades.		
IP. 224	<b>MANUFACTURING PROCESSES IV</b>	(5-3)	
	Further experience in the milling machine including the use of the rotary table, dividing head for the production of gears and use of the over-arm; operation of the die sinking machine and pantograph for the production of a simple mould and jig; the turret lathe and automatic screw machine; the keyseating machine, illustrating the use of the indexing table.		
IP. 225	<b>MANUFACTURING PROCESSES V</b>	(2-6)	
	Heat treatment; surface and cylindrical grinding machines (plunge cut and wheel crushing); spark erosion; the balancing machine; the punch press; time studies on the manual and automatic power saws.		
IP. 226	<b>MANUFACTURING PROCESSES VI</b>	(2-5)	
	Hydraulic systems on engine lathe and shaping machine; numerical control and programming; investigation of machine tool performance, employing dynamometers; batch production of a sample project with investigations into production and marketing costs.		
IP. 232	<b>MECHANISMS</b>	(2-1)	
	Mathematical and drafting room solutions to problems involving the principles of machine elements. Included is a study of motions, linkages, velocities and acceleration of points within a link mechanism; layout methods for cam design; belting; pulleys; gears and gear trains.		
IP. 233	<b>PRESSURE VESSEL DESIGN</b>	(2-2)	
	Design of vessels to ASME and API codes, including pressure vessels, storage tanks, receivers and towers, with an introduction to bin design. Designs to be influenced by anticipated material and fabrication costs.		
IP. 241	<b>ESTIMATING I</b>	(2-2)	
	The determination of manufacturing and tool costs, including methods of determining and distributing indirect expenses and the estimating of material, direct labor and tool costs both by calculation and the use of standard data. Accent is on mechanical and structural work.		
IP. 242	<b>ESTIMATING II</b>	(1-2)	
	A continuation of IP. 241, with emphasis on plate work.		
IP. 251	<b>MACHINE DESIGN I</b>	(2-2)	
	Principles of machine design, including material specifications; classes of fits; tolerances and allowances; beans; bolts; screws; riveted and welded joints; beams; shafts; couplings; brakes; clutches; belts and pulleys; gears; columns; power screws.		
IP. 252	<b>MACHINE DESIGN II</b>	(2-2)	
	A continuation of IP. 251 in which the principles are applied to a design project.		
IP. 261	<b>METHODS TIME MEASUREMENT</b>	(2-1)	
	Labor productivity in industry; functions of methods engineering and operational analysis; method study types and applications; process charts and analysis sheets; systematic consideration of the factor of production in sequence.		
IP. 262	<b>PLANT LAYOUT</b>	(1-2)	
	The principles of plant layout, including operational planning; materials handling; layout methods; practical applications in solving actual plant layout problems.		
IP. 271	<b>METROLOGY I</b>	(2-2)	
	Instruction and practice in the use of: gauge blocks; sine bar; verniers; cylindrical squares; go—no go gauges; thread caliper gauges; optical tools; angle protractor; height setting micrometer; drill point measuring instrument.		
IP. 272	<b>METROLOGY II</b>	(2-2)	
	Instruction and practice in the internal thread comparator; tri-roll comparator; floating carriage measuring machine; optical dividing head; pitch measuring machine; microptic auto collimator; circular division tester; air gauging.		

IT. 100	<b>MECHANICS AND FORCE FIELDS</b>	(8-2)	IT. 221	<b>AUTOMATIC CONTROL I</b>	(4-4)
	The relation between Physics and Industrial Instrumentation. The instrumentation technician in industry. Measurement. Basic physical quantities and unit systems. Structures and properties of matter. Uniform motion, acceleration. Graphical vector presentation. Force and motion. Torque, rotational motion and orbits. Friction. Work, energy, power, momentum. Analogies between gravitational, electric and magnetic force fields. Molecular forces in solids and liquids, strength of materials.			An introduction into systems engineering using the mathematical tools developed in Math. 228. In the laboratory the theoretical results are compared with actual process dynamics.	
IT. 101	<b>INSTRUMENTATION I</b>	(3-0)	IT. 222	<b>AUTOMATIC CONTROL II</b>	(1-4)
	Introduction to the concepts of automatic control and feed-back; study of pneumatic pressure, flow, liquid level and temperature instruments.			Continuation of the laboratory exercises of IT. 221.	
IT. 102	<b>INSTRUMENTATION II</b>	(3-0)	IT. 231	<b>SYSTEM FAULT ANALYSIS</b>	(0-8)
	Continuation of IT. 101. Study of pneumatic controllers, control valves and actuators; humidity measurement.			A systematic approach to fault-finding on process plants in operation. Typical faults are introduced into automatic laboratory process plants by the instructor; these have to be located and eliminated by the students.	
IT. 103	<b>FLUID DYNAMICS</b>	(2-0)	IT. 232	<b>SYSTEM APPLICATIONS</b>	(0-8)
	Temperature, heat, absolute temperature. Kinetic molecular theory and the properties of gases. Bernoulli's equation, the flow of liquids and gases through restrictions and pipes. The effects of viscosity in fluid flow. The measurement of fluid flows by pressure differential.			A continuation of the lab course IT. 231, but dealing also with the start up of new control systems, design improvements on existing systems, the design and specification of relatively simple new control systems.	
IT. 111	<b>INSTRUMENT MAINTENANCE I</b>	(0-5)	IT. 251	<b>COMPUTERS</b>	(3-4)
	The course applies immediately, in the laboratory, what has been learned in theory in IT. 101. Small industrial plants and closed circuit TV are used as teaching aids. Maintenance and installations are carried out as in practice.			An introduction into analogue computer circuitry and operation. Application for automatic control problem solving.	
IT. 112	<b>INSTRUMENT MAINTENANCE II</b>	(0-5)	IT. 271	<b>ANALYTICAL INSTRUMENTS</b>	(2-0)
	Continuation of IT. 111. Simultaneous laboratory application of theory gained in IT. 102 lectures. Student gains experience by aligning, tuning and overhauling control valves and controllers.			This course deals with analytical instruments not previously covered: Mass spectrometer, infrared analysers, gas chromatographs and other specialized process analysers.	
IT. 203	<b>INSTRUMENTATION III</b>	(4-0)	Math. 101	<b>INTRODUCTION TO TRIGONOMETRY</b>	(5-0)
	This course deals with the application of electronics to process instrumentation. The electronic products of the major instrument manufacturers are studied. Other topics are: servo-driven potentiometers and thermo-couples; resistance bulb servo-driven bridges; pH meters; electro pneumatic transducers; electrical tele-metering; oil and gas field automation; measurements with isotopes; gas chromatograph.			The course begins with an intensive study of the use of the slide rule. This is followed by right and oblique triangles solved by slide rule. Log-arithmetic computations are then studied. The course concludes with a study of rectangular and polar coordinates and angles in all quadrants.	
IT. 204	<b>MASS TRANSFER AND RATE PROCESSES</b>	(4-0)	Math. 102	<b>ANALYTICAL TRIGONOMETRY</b>	(5-0)
	A study of fundamental chemical engineering applications as used in industrial chemical engineering equipment: Heat transfer, evaporation, distillation, absorption and extraction, humidification, drying, filtration.			The course includes a study of vectors, complex notation and vector algebra. This is followed by sine wave theory. Natural logarithms and exponential equations make up the third major topic. The course concludes with solutions of linear equation by means of graphical methods and determinants.	
IT. 205	<b>GAS INSTRUMENTATION</b>	(2-2)	Math. 103	<b>INTRODUCTION TO CALCULUS</b>	(2-0)
	Continuation of IT. 204. More advanced study of control and regulating instrumentation as used in oil and gas industries; oil and gas field automation.			This course begins with considerable work in graphical analysis of equations including graphical determination of differentials and integrals. Following this is the study of the algebraic methods of differentiation power, trigonometric and logarithmic functions.	
IT. 213	<b>INSTRUMENT MAINTENANCE III</b>	(0-3)	Math. 111	<b>ALGEBRA AND GEOMETRY</b>	(5-0)
	Applies immediately, in the laboratory, what is learned in IT. 203. Student learns by doing maintenance under plant conditions.			Description as for Math. 101, with more emphasis on work included in High School Math. 30.	
			Math. 112	<b>TRIGONOMETRY</b>	(5-0)
				Description as for Math. 102, with more emphasis on work included in High School Math. 30.	

**Math. 113**

**CALCULUS I**

(3-0)

Description as for Math. 103, with more emphasis on work included in High School Math. 30.

**Math. 121**

**INTRODUCTION TO TRIGONOMETRY**

(3-0)

This course begins with the study of the slide rule. Right and oblique triangles are solved by slide rule methods. The course concludes with a study of rectangular and polar coordinates. Math. 121 differs from Math. 101 in that logarithmic computations are not included.

**Math. 122**

**ANALYTICAL TRIGONOMETRY**

(3-0)

A detailed study of sine wave theory, harmonic motion and parametric equations forms the first major topic. The second topic includes vectors, complex notation, and vector algebra. The course concludes with an introduction to logarithms.

**Math. 123**

**CALCULUS FOR ELECTRONICS**

(6-0)

The first portion of the course includes the study of exponential equations and natural logarithms prerequisite to the study of calculus. The student then learns the algebraic techniques of differentiation and integration of power, trigonometric, and exponential functions. All problems are oriented to electronics theory. In contrast to Math. 103, 104, there is no stress on graphical methods.

**Math. 127**

**TRIGONOMETRY**

(6-0)

This course is a combination of Math. 123 and Math. 224—see these courses for description.

**Math. 204**

**INTEGRAL CALCULUS**

(3-0)

This course concludes the math. program and is primarily a study of integration techniques. The final three weeks is devoted to the solution of a variety of practical problems using all previous mathematical methods.

**Math. 214**

**CALCULUS II**

(3-0)

Description as for Math. 204, with more emphasis on work included in High School Math. 30.

**Math. 224**

**TRIGONOMETRY**

(3-0)

Identities; equations. Sine waves—mathematical addition, harmonic, amplitude and phase relationships. Analysis of non-sine waves; Lissajous figures; fundamental operation with complex and polar notations. Vectors—changing and rotation; Euler's equation; DeMoivre's theorem. Short cuts—partial fractions; relative errors; slopes and rate of change. Increments—work force diagrams; non-linear equations.

**Math. 225**

**CALCULUS I**

(3-0)

Differentiation—algebraic method, limits, general rules; sum and difference; maxima and minima values; basic trigonometric functions; repeated differentiation; second derivatives; application to falling bodies. Integration—mechanics of indefinite integrals; application to acceleration; area determination; average values; basic trigonometric functions; volumes; inverse fractions. Exponential functions and calculus—natural logarithms; electrical transients.

**Math. 226**

**CALCULUS II**

(3-0)

Hyperbolic functions—integration and differentiation in electrical application. Series—MacLaurin; Taylor; Fourier. Wave analysis by graphs and tables; LaPlace transforms tables and applications.

**Math. 228**

**CALCULUS**

(6-0)

This course is a combination of Math. 225 and Math. 226—see these courses for description.

**ML. 101**

**HOSPITAL ORIENTATION**

(0-10)

Hospital organization; technician-patient and technician-staff relationships; Code of Ethics; Canadian Society of Laboratory Technologists Organization; visit to affiliated hospitals.

**ML. 102**

**LABORATORY ORIENTATION**

(5-8)

then (8-9)

An introduction to procedures and instruments used in medical laboratories; laboratory mathematics and records; anatomy and physiology; pathology.

**ML. 111**

**BACTERIOLOGY**

(4-8)

then (5-8)

Cellular morphology; cultural characteristics; growth requirements of pathogenic and non-pathogenic bacteria in man; introduction to fungi, parasites and viruses; basic principles in immunology. Lab work includes growth and identification of microorganisms.

**ML. 121**

**CLINICAL CHEMISTRY**

(5-10)

then (8-10)

Structure, properties, reactions and metabolism of carbohydrates, fats and proteins; acid-base balance; chemical changes due to disease; principles, procedures and apparatus used in clinical chemistry methods. Lab work includes analysis of body fluids such as blood, urine and cerebrospinal fluid.

**ML. 131**

**HEMATOLOGY**

(5-8)

then (3-8)

Study of the composition, functions and disease of the blood and blood forming tissues; coagulation theory; blood groups. Lab work includes hemoglobin measurement; cell counts; determination of clotting factors; blood grouping; cross matching for transfusions.

**ML. 141**

**HISTOLOGY**

(2-2)

then (2-4)

Collection, preservation, processing of human tissue and fluids for examination by a pathologist, together with related lab work.

**MT. 101**

**PROPERTIES OF MATERIALS**

(3-0)

An introduction of strength of materials, this course covers the physical constant of metals, plastics, wood and ceramics; the effect of structure; extraction techniques, manufacturing techniques and subsequent treatment on material properties.

**MT. 102**

**MATERIAL SAMPLING AND TESTING**

(1-1)

Basic principles of quality control; physical and statistical methods of sampling; homogeneity of materials; physical methods of material testing.

**MT. 111**

**DESTRUCTIVE TESTING I**

(1-3)

Theory and practice in destructive testing methods. Complete familiarity with equipment will be attained; emphasis will be placed on the mechanical and hydraulic operating systems of the equipment.

MT. 121

**NON-DESTRUCTIVE TESTING I**

(0-3)

Theory of non-destructive testing methods—ultrasonic, magnetic particle, x-ray and gamma ray inspection will be covered. Safety measures in radiation rooms will be stressed strongly. Laboratory will consist of lecture and demonstration by instructor.

MT. 131

**BASIC METALLURGY**

(2-1½)

The nature and behaviour of metals; crystal structure; theory of alloys and principles of heat treatment. The student will become familiar with preparation of specimens for microscopic examination.

MT. 203

**ENGINEERING MATERIALS**

(2-0)

Production methods, properties, uses and selection of all types of engineering materials used in industry.

MT. 204

**PROPERTIES OF MATERIALS**

(3-3)

Strength of materials; selection of materials for particular applications; corrosion; heat treatment; inspection of metals. Laboratory will stress material testing methods.

MT. 205

**MATERIALS AND PROCESSES I**

(5-0)

Methods of material production. Flow sheets will be used to familiarize student with industrial processes. Course will cover wood, paper, plastics, metals, ceramics, rubber and food processing.

MT. 206

**MATERIALS AND PROCESSES II**

(2-0)

A continuation of MT. 205, this course covers oil, gas, petrochemical and power generation processes.

MT. 212

**DESTRUCTIVE TESTING II**

(2-3)

Theory and practice in destructive testing methods. Data presentation and analysis of laboratory results will be emphasized.

MT. 213

**DESTRUCTIVE TESTING**

(0-3)

This is a laboratory course which will familiarize students with the destructive methods of physical testing. Student will become adept at using the various testing machines and preparing samples for testing and inspection.

MT. 222

**NON-DESTRUCTIVE TESTING II**

(2-3)

Theory of x-ray and gamma ray inspection will be covered further. Theory of radiography will be stressed. Laboratory assignments will give students the opportunity to study exposure times and other radiation techniques.

MT. 223

**NON-DESTRUCTIVE TESTING III**

(2-3)

Advanced theories in ultrasonics and other testing methods not covered in lab work. Laboratory hours will allow student to further his knowledge of non-destructive techniques.

MT. 224

**NON-DESTRUCTIVE TESTING**

(1-3)

This course covers principles used in the non-destructive testing of materials. Instruction will be given in the manipulation of the equipment used. Magnetic particle, ultrasonic, x-ray and gamma radiography will be covered. Special attention will be given to the protection and safety measures necessary in the use of the equipment.

MT. 232

**PHYSICAL METALLURGY I**

(2-3)

The physics of metals; freezing; diffusion; solutions; mechanisms of failure; corrosion; equilibrium diagrams; phase changes; mechanics of hardening metals.

MT. 233

**PHYSICAL METALLURGY II**

(3-3)

Physical metallurgy theory will be utilized as a basis for the discussion of ferrous and non-ferrous metals and alloys. Laboratory assignments will stress specimen preparation for microphotography.

MT. 234

**PHYSICAL METALLURGY III**

(3-3)

Physical metallurgy theory will be utilized as a basis in the discussion of methods of production, fabrication and protection of metals. Lab assignments will stress the identification of various microstructures.

MT. 241

**PROPERTIES OF NON-METALLICS I**

(3-3)

The student will study the various processes involved in the manufacture of plastics, ceramics, wood and other non-metallic engineering materials. The structure and properties of these materials will be discussed in lecture and examined in the laboratory.

MT. 242

**PROPERTIES OF NON-METALLICS II**

(3-3)

Further lectures on non-metallics covering their uses now and in the future. Protective coatings of all types will be discussed. The laboratory will consist of further examination of structure and physical properties.

MT. 251

**MATERIAL SPECIFICATIONS**

(3-0)

How and what material to specify for a particular duty; standard methods of specifying materials; use of handbooks to aid in material specification.

MT. 261

**TECHNICAL PROJECT**

(0-3)

During the sixth quarter the students will be assigned projects similar to those which they will meet in industry. The student will be responsible for the method in which he attacks the problem and how he solves it. Reference reading and individual discussions with the instructor will be undertaken before the student begins actual laboratory work.

MT. 271

**MATERIAL BALANCE**

(2-0)

Industrial stoichiometry. The balancing of material quantities used in the production situation.

OM. 101

**TYPEWRITER LABORATORY (Standards)**

The disassembly, cleaning, reconditioning, spray painting, reassembly and adjustment of manual typewriters.

OM. 101A

**BASIC TYPEWRITER THEORY**

History of office machine and typewriter development. Principles of typewriter operation and design. Basic principles of standard typewriter adjustment and repair. Use and care of special tools. Types and methods of adjustments. Cleaning methods.

OM. 102

**TYPEWRITER LABORATORY**

A continuation of OM. 101, advancing to fractional H.P. motors and basic electrical circuits connected with electric typewriters.

**OM. 102A****TYPEWRITER DESIGN PRINCIPLES**

Identification of different typewriters and their basic design. Special machine features. Technical terms. Diagnosis of manual and electric typewriter mechanical failures. How to adjust both types of machines. Performance to be expected of a machine when correctly adjusted. Commonly used mechanical adjustments.

**OM. 103****OFFICE MACHINE LABORATORY**

Continued specialization on electrics. Type soldering and alignment practices. Spare parts identification, storage and ordering. Introduction to adding machines. Special projects for advanced students.

**OM. 111****TYPPING**

Aim is to provide the technician with an appreciation of the problems encountered by the office typists, who oftentimes initiate the request for a service call. Some element of personal use by the technician of typing skill is also involved. Touch method is introduced. Practice drills, mechanical arrangement of business correspondence, tabulation and special report set-up problems, manual and electric typing, and development of speed to 30 w.p.m. are included in the course.

**Phys. 101****HEAT; SOUND; OPTICS**

(4-2)

Fields and uses of physics; temperature measurement; heat quantities; heat transfer; thermodynamics; wave motion; sound waves; light and illumination; reflection of light, refraction of light; thin lenses; the eye; optical instruments.

**Phys. 102****ELECTRICITY AND MAGNETISM**

(4-2)

Dispersion; spectra; color; interference and diffraction; polarized light; electric charges and fields; electric potential; electric current; electric circuits; electrical measurement; electrical energy and power; magnetic effects of electric current; electric instruments.

**Phys. 103****MODERN PHYSICS**

(4-2)

Alternating current series circuits; conduction in gases; basic electronics; relativity and quantum theory; elementary atomic physics; solid state physics; elementary nuclear physics.

**Phys. 111****MECHANICS**

(4-2)

Vectors; velocity and acceleration; force and motion; projectile motion; friction; work and power; energy; torque; rotation of rigid bodies; momentum; uniform circular motion; vibratory motion.

**Phys. 121****LIQUIDS; HEAT; ELECTRICITY**

(3-0)

Measurement; liquids at rest; fluids in motion; temperature measurement; heat quantities; sound waves; acoustics; electricity current; electricity circuit; electricity measurements.

**Phys. 131****ELECTRICITY AND MAGNETISM**

(3-0)

The fields and uses of physics; electric charges and fields; electric potential; electric current; electric circuits; electrical measurements; magnetic effect of electric current; electric instruments.

**Phys. 132****LIQUIDS; GASES; HEAT**

(3-0)

Liquids at rest; properties of gases; temperature measurement; heat quantities; heat transfer; vectors; velocity; acceleration.

**Phys. 133****MECHANICS**

(3-0)

Force and motion; projectile motion; friction; work and power; energy; torque; rotation of rigid bodies; momentum; uniform circular motion.

**Phys. 141****LIQUIDS; GASES; HEAT**

(3-0)

Liquids at rest; properties of gases; temperature measurement; heat quantities.

**Phys. 142****HEAT TRANSFER & MECHANICS**

(3-0)

Heat transfer; basic thermodynamics; vectors; velocity; acceleration.

**Phys. 151****LIQUIDS; GASES; HEAT**

(3-0)

Fields and uses of physics; electric properties of solids; liquids at rest; properties of gases; molecular theory of matter; temperature measurement; thermal expansion; heat quantities.

**Phys. 152****MECHANICS**

(2-2)

Vectors; forces at a point; velocity and acceleration; force and motion; projectile motion; friction; work and power.

**Phys. 153****ELECTROSTATICS**

(4-0)

Energy; wave motion; electric charges and fields; electric current; electric circuits; electrical measurements; electric energy and power; magnetic effects of electric current; electric instruments; induced EMF.

**Phys. 161****OPTICS**

(4-2)

Light and illumination; reflection; refraction; thin lenses; the eye; optical instruments; dispersion; interference; polarization.

**Phys. 171****INDUSTRIAL PRODUCTION**

(4-2)

Fields and uses of physics; temperature measurement; heat quantities; heat transfer; thermodynamics; wave motion; sound waves; light and illumination; reflection of light; refraction of light; thin lenses; the eye; optical instruments.

**Phys. 181****ELECTRICITY & MAGNETISM**

(5-0)

Electric charges; units; current and resistance; DC circuits; electric power and heating effect; magnetism; sources of magnetic fields; induced EMF; DC sources; fluids at rest; and fluids in motion.

**Phys. 213****MODERN PHYSICS**

(3-0)

Wave motion; sound waves; light and illumination; reflection of light; refraction of light; thin lenses; dispersion; polarized light; elementary nuclear physics.

**Phys. 214****OPTICS AND MODERN PHYSICS**

(5-0)

Wave motion; sound waves; light and illumination; reflection of light; refraction of light; thin lenses; the eye; optical instruments; dispersion; color; interference and diffraction; polarized light; relativity and quantum theory; elementary nuclear physics.

**Phys. 234****SOUND AND MODERN PHYSICS**

(3-0)

Elastic properties of solids; vibratory motion; wave motion; sound waves; atomic theory at matter; semi-conductors.

**Phys. 235****OPTICS**

(3-0)

Principles of electrochemistry; light and illumination; reflection; refraction; thin lenses.

Phys. 236

**OPTICS**

(3-0)

Optical instruments; dispersion; spectra; color; interference; diffraction; polarized light.

Phys. 243

**MECHANICS**

(2-0)

Force and motion; projectile motion; friction; work and power; energy; circular motion.

Phys. 244

**OPTICS**

(2-0)

Wave motion; sound waves; acoustics; reflection of light; refraction; thin lenses.

Phys. 245

**THERMODYNAMICS**

(2-0)

Thermodynamics.

Phys. 254

**OPTICS AND MODERN PHYSICS**

(4-0)

Refraction of light; thin lenses; dispersion; spectra; interference and diffraction; polarized light; relativity and quantum theory; elementary atomic physics; solid state electronics; elementary nuclear physics.

Phys. 262

**ELECTRICITY AND SOUND**

(4-2)

Short introduction to physics; electrostatics; DC and AC electricity; photo electricity; basic electronics; sound.

Phys. 282

**MECHANICS**

(3-0)

Force and motion; projectile motion; friction; work and power; energy; torque; rotation of rigid bodies; momentum; uniform circular motion.

PT. 101

**INTRODUCTION TO PHOTOGRAPHY**

(3-0)

History and fundamentals of camera design; development of photographic chemicals and processes; development and design of the enlarger; types of enlargers and their uses; light meters—types and proper usage; building the negative and positive; the care and maintenance of photographic equipment.

PT. 102

**DARKROOM PROCEDURES**

(1-1½)

Printing, developing and enlarging photographic film and prints, including the study of photographic chemicals and processes, basic paper and negative control procedures, black and white developing and printing, methods of exposure and development and types of enlargers and their uses.

PT. 111

**CAMERA CONTROL**

(4-5)

Basics of large camera technique; vertical and horizontal correction, rising front, lateral shift. Determination of exposure factors, by means of compression and expansion techniques. Location of "point of view"; circle of confusion considerations.

PT. 112

**DEVELOPMENT CONTROL**

(8-6)

Basic paper and negative control procedures; densitometry and sensitometry; black and white developing and printing; methods of exposure and development.

PT. 113

**PRINT CONTROL**

(3-6)

Technical considerations in black and white photography; consideration of difficult negative exposure and resulting print problems; introduction to studio lighting; development and exposure of roll film; training in flash bulb and electronic flash.

PT. 121

**APPLIED TECHNIQUES**

(3-6)

On location training of techniques learned in the classroom and laboratory; studio lighting problems; the lighting and photography of glass, metal, jewellery, etc.; techniques of copying, line copy and continuous tone.

PT. 122

**AESTHETICS AND PERSPECTIVES**

(2-4)

Relative and compositional forms leading to the formation of general rules of photographic picture quality; development of such picture forms as motion, balance, unity, clarity, carrying power, dominance, harmony.

PT. 131

**BLACK AND WHITE**

(4-8)

Techniques of camera expression through use of photographic and technical devices, such as forced perspective, multiple printing, backlighting, reticulation, masking, etc.; introduction to specialized fields of portraiture and commercial and retail photography; photography on location; black and white retouching.

PT. 132

**PROJECT**

(2-4)

A photographic essay or production covering all aspects of photography covered to this point. Emphasis will be put on originality and technique.

PT. 203

**PHOTO DRAFTING**

(1-3)

Methods of photography models and field installations; reproduction of photos on drafting material; techniques of combining photographs and drawings; plain storage using microfilm techniques; photostats; darkroom procedures.

PT. 204

**PHOTO EMPLOYMENT ORIENTATION**

(3-0)

Introduction to various fields of photographic employment, including industrial, scientific, portrait and commercial and retail areas; guest lecturers in specific fields; consideration of specialized requirements of each.

PT. 241

**INTRODUCTION TO COLOUR**

(6-15)

The history, theory and practice of colour photography, including transparency, and negative colour, internegatives and introduction to colour printing techniques, using viewing and colour correction methods.

PT. 242

**ADVANCED COLOUR**

(6-6)

Training in the use of densitometers, colour analyzers and enlargers; preparation, spotting and handling of colour prints; retouching of colour negatives.

PT. 251

**SPECIALIZATION OPTION**

(6-3)

*(Retail or Portrait and Commercial)*

Advancement of training in area of specialization covering advanced lighting and posing in portraiture; creativity, expression, model posing, etc., in commercial; and emphasis on amateur and professional markets, customer interpretation, camera construction and product familiarity in the retail field.

PT. 252

**ADVANCED OPTION**

(3-10)

*(Retail or Portrait and Commercial)*

Using the studio as a photographic medium; refinements of technique in all areas; corrective and glamour portraiture; still life and illustrative commercial work; selling techniques and relative photography in the retail field.

PT. 261	<b>AUDIO-VISUAL</b>	(3-3)	RA. 225	<b>AIR CONDITIONING SYSTEMS</b>	(5-0)
	Introduction of materials and equipment and their uses; emphasis on clarity of approach for production of teaching mediums; elements of script writing and audio-visual continuity.			Air conditioning systems; central stations; medium and high velocity duct systems; double duct systems; induction systems; cooling panels; heat pump.	
PT. 271	<b>MOTION PICTURE</b>	(4-10)	RA. 226	<b>AIR CONDITIONING SYSTEMS ANALYSIS</b>	(0-10)
	Introduction to motion pictures—the cameras and the materials; basics of script writing, pictorial flow, direction and effects; editing and its devices—the fade, the dissolve, A and B rolling, titling, sound recording.			Testing of laboratory equipment to parallel theory RA. 225. Field trips and technical reports.	
RA. 101	<b>BASIC REFRIGERATION</b>	(4-0)	RA. 231	<b>AIR CONDITIONING CONTROLS I</b>	(2-2)
	Basic refrigeration cycles; refrigerants; compressors; system components.			Construction and operation of electric and pneumatic air conditioning control elements.	
RA. 102	<b>BASIC REFRIGERATION LAB.</b>	(0-6)	RA. 232	<b>AIR CONDITIONING CONTROLS II</b>	(3-2)
	Operation and care of refrigeration hand tools; compressor construction, repair and testing; refrigerant piping; refrigerating metering devices.			Selection and operation of pneumatic control systems.	
RA. 103	<b>REFRIGERATION EQUIPMENT</b>	(5-0)	RA. 233	<b>AIR CONDITIONING CONTROLS III</b>	(3-4)
	System components; single unit installations; multiple installations; special applications.			Design, selection, operation and maintenance of electrical, electronic and pneumatic control systems.	
RA. 104	<b>REFRIGERATION EQUIPMENT LAB.</b>	(0-4)	V. 150	<b>PATTERN DRAFTING</b>	
	Installation of single and multiple units, complete with auxiliary equipment.			Fundamentals of garment construction including measuring, drafting, cutting, marking, fitting and finishing. Machine operation and care. Several projects are covered to provide practice in techniques and methods. This course is for beginners who have had little previous experience or those who wish to refresh their sewing experience before proceeding to more advanced courses.	
RA. 105	<b>REFRIGERATION SYSTEMS</b>	(6-0)	V. 250	<b>ADVANCED DRAFTING</b>	
	Refrigeration load calculations; selection of equipment and controls; sizing of piping; special applications, absorption refrigeration; natural gas engine and turbine applications.			Sewing techniques in bound button holes, bound pockets, gussets, button loops, Shirring, mitered corners, zippers and plackets. Drafting techniques in kimono and raglan sleeves, shawl collars, pleated and circle skirts.	
RA. 106	<b>REFRIGERATION SYSTEMS ANALYSIS</b>	(0-6)	V. 350	<b>TAILORING</b>	150 hours
	Commercial and industrial refrigeration systems analysis; trouble shooting and service; maintenance; field trips and technical reports.			Advanced sewing is a necessity to follow this course which includes coats, suits and high style dresses. Designing and drafting the proper garments for different figures.	
RA. 221	<b>BASIC AIR CONDITIONING</b>	(5-0)	XR. 101	<b>ORIENTATION</b>	(1-0)
	Basic thermodynamics; the psychometric chart; air and human comfort; air conditioning load analysis—summer and winter; load calculations; air distribution; hot water and steam heating; pump and water flow.			History of development of radiography and the radiographic technician; elementary principles of Roentgenography, ethics and administration; Medico-legal aspects.	
RA. 222	<b>BASIC AIR CONDITIONING LAB</b>	(0-6)	XR. 102	<b>OFFICE PROCEDURES</b>	(1-0)
	Exercises and problems using psychrometric chart; air conditioning load analysis; load calculations, using various methods; heating design and report; steam flow; pumps and water flow experiments.			Introduction to methods of medical filing and record keeping; data production; routine office procedures.	
RA. 223	<b>AIR CONDITIONING EQUIPMENT</b>	(5-0)	XR. 111	<b>RADIOGRAPHIC MATHEMATICS</b>	(1-0)
	Fans; coils; dampers; air cleaning; humidification; dehumidification; evaporative cooling; cooling towers and other heat rejection equipment.			Brief revision of mathematical calculations and formulae relevant to radiography.	
RA. 224	<b>AIR CONDITIONING EQUIPMENT LAB</b>	(0-8)	XR. 121	<b>ELECTRICAL AND RADIATION PHYSICS</b>	(1-1)
	Testing of laboratory equipment to parallel theory RA. 223. Study of NAIT air conditioning details and building mechanical system.			Study of magnetism and electricity; atomic theory; electric currents and circuits; electromagnetic waves; x-ray radiation. Students will carry out set experiments, write up and interpret the results.	

**XR. 122**

**RADIOBIOLOGY I**

(1-0)

Radiation—its measurement and biological effects; protection; hazards; monitoring; electrical hazards; principles of radiation therapy.

**XR. 131**

**PHOTOGRAPHIC ASPECTS OF RADIOGRAPHY**

(1-1)

Fundamentals of photographic processing, x-ray films, developing, fixing, etc.; process apparatus, preparations of solutions, darkroom procedures, fault correction; photographic equipment, films, techniques, printing. Students will be required to perform set experiments, write up and interpret results.

**XR. 141**

**APPARATUS AND ACCESSORY EQUIPMENT I**

(2-1)

Power supply; circuits; x-ray tube; instruments; controls; accessory equipment, such as filters, viewing boxes, etc.; stereoscopy and special techniques such as cineradiography.

**XR. 151**

**NURSING ESSENTIALS**

(1-1)

Organization of the hospital; responsibilities of a technician to a patient; techniques of moving patient, arranging pillows, etc.; asepsis; handling of emergency patients and those under anaesthesia; preparation of patients for x-ray procedures. Students will be required to practice the relevant techniques under supervision.

**XR. 152**

**ANATOMY AND PHYSIOLOGY**

(5-0)

Embryology; anatomical terms; surface anatomy and positioning landmarks; x-ray anatomy; simple basic physiology.

**XR. 153**

**BASIC MEDICAL SCIENCES**

(1-0)

Basic pathology in anatomical detail, bacteriology and pharmacology.

**XR. 161**

**RADIOGRAPHIC TECHNIQUES I**

(4-7)

Photographic effect of x-rays; variations and techniques required; techniques for radiography of various bones and organs in detail; special procedures for bedside radiography. Students will be required to record data and perform set experiments.

**XR. 203**

**SEMINAR**

(4-0)

This period is allotted so that students may bring forward their radiographic problems and queries for answer by the Instructors or for group discussion.

**XR. 223**

**RADIOBIOLOGY II**

(6-0)

A further study of the biological effect of radiation, principles of radiation therapy and measurement of radiation. This short course will consist of lectures and demonstrations only but the student will be expected to take notes and interpret the results.

**XR. 242**

**APPARATUS AND ACCESSORY EQUIPMENT II**

(3-3)

This will be a review of XR. 141 and an introduction to the remaining accessories with which the student will come in contact in the X-ray Department of a hospital.

**XR. 262**

**RADIOGRAPHIC TECHNIQUES II**

(8-6)

This will be a review of XR. 161 and an introduction to the remaining accessories to bring forward any problems met with in the hospital in carrying out the procedures covered by that course. Further specialized techniques will be demonstrated and students will practice these and write up notes and data.







